VOL. XXIV JUNE 1954 No. 2

CALENDAR MARCHES ON

By Elisabeth Achelis

I	Once Upon a Time	51
II	At History's Dawning	54
III	By the Light of the Moon	56
IV	Where Flows the Nile	58
V	Render Unto Caesar	62
VI	Constantine and the Week	67
VII	Gregory's Contribution	70
VIII	Developments in Israel	74
IX	Realm of the Crescent	77
X	Century of Preparation	81
XI	Thirteen's Rise and Fall	89
XII	Russia's Difficulties	91
XIII	India's Confusions	93
XIV	World Calendar Reform	95
XV	World Holidays	99

Copyright 1954 by The World Calendar Association, Inc.
Permission is granted to reprint all or parts of this Journal, with or without credit.

Charles D. Morris, Editor Linda Halsted, Associate Editor

Published by The World Calendar Association, Inc.
International Building: 630 Fifth Ave., New York 20, New York

Printed in the United States of America by
CHILTON COMPANY, PRINTING DIVISION
New York • Philadelphia

A review of the past
A survey of the present
A plan for the future
In the process of acceptance

At the request of the Government of India, The World Calendar has been placed before the United Nations at the meeting of its Economic and Social Council in Geneva, July 1954.

The subject involves a variety of historical factors and requires some comprehensive knowledge of the numerous calendars currently in use throughout the world.

To assist the delegates at ECOSOC, it is timely to present a brief interpretation of these important backgrounds, supplementing and summarizing the somewhat scattered material already available.

CALENDAR MARCHES ON

By Elisabeth Achelis

✧✧✧ *Chapter I*

ONCE UPON A TIME

A wonderful stream is the River Time,
With a faultless rhythm and a musical rhyme,
And a broader sweep, and a surge sublime,
As it blends with the Ocean of Years.
—B. F. Taylor

PRIMITIVE man's first efforts at measurement dealt with his need for recording the passage of days. The attempt to formulate a calendar was his earliest organized achievement. From this beginning he progressed to measure other things—length, height, weight and distance. The arts of writing, architecture and mathematics were inevitable results of the calendar.

Calendars came long before clocks. Measurement of days into convenient bundles—such as weeks, months, seasons and years—was more important than the counting of hours, minutes and seconds. The cave man felt no need for hourglass or sundial. Clocks, as precise measurers of Time, did not come into use until the thirteenth century. Meanwhile the quest for calendar improvement had been going on for thousands of years.

Creating a good calendar was a baffling problem. Many ingenious experiments were attempted in seeking the answer. The difficulty was always how to establish an accurate and harmonious relationship between the various natural time markers provided by the sun, moon and stars. Perfecting the calendar was a long and arduous process that has continued through the ages and is still with us.

Ancient Babylonians and Egyptians, Julius Caesar and Pope Gregory XIII were all pioneers in devising a better time system. Upon their endeavors rests the calendar of today: they were the builders of the calendar now used by the Western world—which to a certain extent has also been accepted by Eastern nations, operating alongside such diverse systems as those of the Jews, the Moslems and the peoples of India.

The Caesar-Gregory calendar which we have today is far from perfect. It still contains annoying irregularities and inherited inconveniences which demand correction—especially in an age when men are living closer together

and when their many interrelated activities call for a high level of accuracy, order and stability.

Proposed improvements have been a matter of international concern from the beginning of this century. Demand for their enactment came first from the International Chamber of Commerce in 1910; the movement was making progress when World War I interfered. It was further advanced by the League of Nations from 1923 until 1939 when World War II interrupted. It came before the United Nations in 1947, when Secretary-General Trygve Lie made a comprehensive report that provided the basis for legislative proposals in 1949 and again in 1953.

In the latter year, the initiative came from India, which submitted a motion supported by a Council vote of 12 to 2, stating: "The Government of India consider that the plan for the reform of the Gregorian Calendar proposed by The World Calendar Association is of great importance to the nations of the world. The purpose is to adopt for the whole world a new, fixed, uniform and invariable calendar, more regular, scientific and advantageous than the Gregorian."

An accompanying Memorandum added: "The ideal of the whole world is to have a logical and perpetual calendar to replace the present, because it is widely recognized that the calendar we now use is unsatisfactory for the economic, social, educational, scientific and other activities of man. Modern progress demands the change. . . . Such a revision has been the subject of study and research on the part of experts, institutions and international organizations for many years. The consensus of opinion is that a new time system is necessary . . . that it should be uniform, an invariable calendar, perpetually the same."

Thus calendar reform became an urgent matter for international action in 1954.

The objective is to establish a single standard civil calendar for the entire world, a scientific system of time measurement, without sectional, racial or sectarian influence. The improvements required are that the new calendar should adjust the irregular length of months, should equalize the quarterly divisions of the year, should coordinate the various time units, and should arrange the weekday sequence so that weekdays and month-dates will agree and be identical in succeeding years—thus restoring the "perpetual" quality which was lost with the introduction of the seven-day week in 321 A.D. The chief difficulty with the calendar is that there are 52 1/7 weeks in a 365-day year: the extra 1/7 of a week causes the weekday wanderings. And this is a serious defect in a system of measurement that should be as precise and invariable as are our other scientific systems of measuring. The wanderings of the calendar are increasingly burdensome to an advancing civilization that demands accuracy, reliability and efficiency in its activities, its planning, its records and its statistics.

Inasmuch as the revised calendar is on the threshold of acceptance, there are doubtless many people who will welcome a brief account of the history of the movement and its background in Egypt, Rome, Palestine, India and the Arab world.

The onward march of calendar reform to its goal is, I am convinced, inevitable. The proposed changes can be put into effect without serious dislocation or disturbance, and with many benefits that will prove of practical advantage and profit to everybody, everywhere.

One of the benefits is that the enactment of a revised calendar provides an immediate pattern of international cooperation, a tangible proof of world unity in action. This was emphasized in the Memorandum submitted to the United Nations by India, which stated in one of its final paragraphs: "The 365th day of the year in The World Calendar is proposed to be an international holiday, without any weekday name, dedicated simultaneously in every country of the world to the universal harmony and unity of mankind, thus knitting all races, creeds, peoples and nations into a closer bond of fellowship, creating world-wide citizenship in the *One World*. The potentialities for strengthening and promoting international peace among all nations are of great value."

When I undertook the leadership of the international movement for calendar reform in 1930, my first task was to confer with outstanding people both at home and abroad, in an effort to organize and unite the widely scattered supporters of the cause. One of my earliest and most enlightening talks was with Mahatma Gandhi, whom I met in London.

For a whole evening I sat with him on the hearth of an old-fashioned coal-burning fireplace in his Knightsbridge residence, and discussed the future of calendar reform. We found ourselves in complete agreement as to the desirability of a change. This was what could be expected from the great leader. But he opened my eyes as to the special situation in India, where there are about fourteen different calendars in current use. "This results in unbelievable confusion," said Gandhi earnestly. "It would be a splendid thing if our 350,000,000 people could have a single national unified calendar. I am in favor of such a calendar. I am in favor of a standardized calendar for the whole world, just as I am in favor of a uniform coinage for all countries and a supplementary artificial language (like Esperanto, for example) for all peoples."

After our interview, Gandhi issued a statement to the press, in which he said: "I have been informed of, and I welcome, the international movement for calendar reform. I am always ready to endorse any honest movement which will help to unify the peoples of the world."

Gandhi's belief in the need for an improved calendar encouraged many of India's leading statesmen and scholars to take up the matter. Among them was his close friend and successor, Prime Minister Jawaharlal Nehru.

Another enthusiast is an eminent scientist, Professor Meghnad N. Saha, head of the Institute of Nuclear Physics in Calcutta, who eventually became chairman of an official India committee on calendar matters. The report of this committee was the energizing force which led to India's forceful action at the United Nations in 1953.

✧✧✧ *Chapter II*

AT HISTORY'S DAWNING

Time was created as
an image of eternity.
—Plato

WHAT is a calendar? According to my definition it is man's chart for reckoning days, planning affairs and dating events. It is a system of arranging the division and recording of Time into years, seasons, months, weeks and days—best adapted to meet the purposes and activities of life.

Among these various time units, man learned after many centuries of trial and error that the *seasons* are at the very heart of the calendar. Their annual recurrence is the foundation upon which an effective and orderly measuring system must be built. From one winter to the next, or from one spring to the next, makes a year of approximately 365¼ days.

The seasons in their familiar and changeable aspects are the essential elements of Time. They are the givers of life and its bounty in their recurring periods of seeding, flowering, harvesting and the dormant season. I am always impressed to read of their importance in the Biblical account of the Creation, "Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years."

The order—seasons, days, years—seems to me significant. Seasons are recognized as the foundation of the matter. It is the annual recurrence of the seasons, the intermediary days, and the year as a complete and finished time unit, which constitute the calendar. With this principle established it is a dependable Time-measurer. Here is the blueprint for man to follow if he is to have a reliable standard time plan for his daily living and his daily activities.

Primitive man, however, could find no easy way to devise a seasonal

calendar. With his limited astronomical knowledge he had no simple marker to define the beginning and the end of a "season." It took him many centuries to determine the exact length of a year. All that he knew, after he had graduated from notches on a tally stick, was the ever-present reliable moon, the regular phases of which made it possible for him to divide Time into separate groupings of about 29½ days each.

Thus all tribes and races of men started with a lunar calendar of one kind or another, and made valiant efforts to adjust the "moonths" (months) into the seasons of a sun or solar calendar.

Historians and philosophers tell us that some of the difficulties of constructing a calendar are due to the fact that it deals with an intangible element called Time. When we ask "What is Time?" we find ourselves facing a problem of the first magnitude. The dictionary gives numerous definitions, many of them baffling to the average mind. (1) Time is that order of phenomena in general by reference to which all permanence and change are predicated, usually conceived as a dimension of reality, distinguished from the spatial by the fact that the order of temporal succession is irreversible. (2) Time is the uninterrupted succession of days, years or events; the passing of the hours. (3) In philosophy, the oldest concept of Time is that of an absolute flowing, which is a reality apart from the events which fill it and which has a fixed uniform rate in terms of which all change is measured.

A British scientist, Clifford Troke, is easier to understand: "Time is a flow, differing from all other flows in this, that everything flows with it; since Time moves continually, all the devices which measure it involve motion—what we do is to take a certain regular motion, a movement as regular as possible, and keep it as a standard measure."

The scholarly poet, Henry W. Longfellow, one of my early favorites, makes a similar observation in his fluent prose. "What is time?" he asks, and answers "The shadow on the dial, the striking of the clock, the running of the sand, day and night, summer and winter, months, years, centuries—these are but arbitrary and outward signs, the measure of Time, not Time itself. Time is the Life of the soul."

To us calendar reformers, Time is a universal force, constantly moving and governing man's life and all its activities. It is as much a part of man as his shadow. Its influence is completely impersonal, universal and self-contained—qualities which must be inherent in any effective system of time measurement, whether it be the clock or the calendar.

Throughout the ages the development of clocks and calendars has been singularly different. Clock-makers seem to have understood the scientific nature of Time; in dividing it into hours, minutes and seconds they carefully avoided extraneous influence. Not since the time of the ancient Babylonians have the hours been given religious, astrological or astronomical

names or interpretations. The clock is strictly a scientific instrument by which the seconds, minutes and hours are counted. The result is that our clocks today are admirable in their accuracy, simplicity and universality. The same clock is observed throughout the world.

Contrast this simplicity and perfection with the clumsy irregularities of the calendar, the result of tampering by alien hands and the injection of foreign and irrelevant ideas. Because of some peculiar human kink, the calendar has all too often been the target of people who used it for personal, religious or nationalistic purposes, or who took a possessive attitude toward it, thereby ignoring the broad universal and scientific requirements essential in time measurements.

The calendar is basically a scientific system of measuring Time—seasons, days and years—and whenever this basic foundation is interfered with the calendar becomes distorted and its rhythmic, balanced and harmonious flow is lost.

Here is the underlying error that has beset all efforts at calendar improvement, whether in ancient days or in our current century. By re-establishing the calendar on a purely scientific basis suitable to our civil and everyday life, we can make it as useful, reliable and efficient an instrument of Time as are our clocks and watches.

✧✧✧ *Chapter III*

BY THE LIGHT OF THE MOON

Thinketh, He dwelleth i' the cold o' the moon,
Thinketh He made it, with the sun to match.
—Robert Browning

WE HAVE seen that primitive man felt an urgent need of measuring Time and counting days. How he first met this need we do not know, but when history begins we find him using, in most cases, some kind of lunar calendar. As H. G. Wells wrote in his *Outline of History*, "The earliest recorded reckoning is by moons."

Primitive man was acutely conscious of the daily recurring light of day and dark of night. His normal pattern of life was to be active in the daytime and to sleep at night. He hunted, fished and foraged for food: he knew a little elementary agriculture and animal husbandry. He was chiefly concerned with his personal and tribal welfare—obtaining sufficient nourishment, clothing, shelter and protection from danger. Gradually along

the road to civilization he began to use tallies; he counted the days on fingers and toes; he used sticks and stones for markers.

He was familiar with the nightly miracle of the moon, which dominated the heavens during the hours of darkness. He was aware of its regular waxing and waning. He marvelled at the new moon's delicate crescent and the full moon's solid orb of light, which he hailed with rejoicing and feasting. He regarded the moon as more essential than the sun, "because it supplied light at night, when light was needed."

The moon was man's faithful friend and guide. Its recurring phases were regular and reliable—new moon, first half-moon, full moon, second half-moon. Here was a celestial chronometer, a heavenly calendar ready-made, providing unfailing markers from which he could count his days. The word *moon*, in its origin, means "measurer."

There are those who believe that the moon's phases, each of about seven days' duration, set apart the grouping of days which we know as a week. Likewise, the complete circuit of the moon's four phases became a moon-th or month.

Unfortunately the duration of a moon-month is not exactly four weeks of seven days each. It is not a precise 28 days, but about 29½ days. To meet this difficulty, primitive man added to his 28-day month an additional one or two days, the brief period of darkness when the moon was not visible in the sky, "when it had gone to sleep." His moon-months were figured at alternately 29 and 30 days.

Eventually the moon-th periods were put together in a bundle of twelve to complete a longer unit, a year. Twelve was a convenient number, "easily divisible in all kinds of ways."

However, this lunar year of twelve moon-months was shorter than the sun-year, which was vaguely marked off by the annual recurrences of the seasons and other climatic conditions. The seasonal year was one of the most important factors in life and could not be ignored. Yet twelve lunar months of alternating 29 and 30 days made up a year of only 354 days, while the sun-year required 365¼ days. The only way a lunar calendar could be adjusted to a fairly accurate seasonal year was to add a 13th month every two or three years, and this is what eventually happened to most lunar calendars.

In ancient days the priesthood was the guardian of the calendar, under whose direction the insertion of the 13th month was made. The priests were the first scientists, the first learned men, and the first civil servants in the social and tribal life of primitive people.

Historically, lunar calendars belong to the infancy of the human race. The moon's phases were something that could be easily observed, that required no printed tables, no great effort and little imagination.

Moon calendars were reasonably adequate at this early stage of man's

development, when his outlook on life was restricted to his tribe and his immediate environment. The moon was the satellite that belonged to the planet earth. Primitive man had not as yet progressed to the greater knowledge that the earth belonged to a vast solar system of which the sun was the central and motivating force. The dim and lesser light of the moon had a limiting and also an emotional effect upon early man which encouraged magic, sorcery, superstition and taboo.

As civilization advanced and developed, the inadequacies of the moon reckoning became more and more apparent. The insertion of an occasional extra month to obtain agreement with the seasonal year became increasingly urgent and the method amazingly complicated. It was in the march of progress that non-seasonal moon calendars should give way to the sun calendar, which automatically recognized the indispensable seasons. It became increasingly evident that a sun calendar had to be separated completely from the moon if it was to be simple, useful and adequate. To serve two masters simultaneously is always difficult.

Moon-Month Calendar

First month	30 days	Seventh month	30 days
Second month	29 days	Eighth month	29 days
Third month	30 days	Ninth month	30 days
Fourth month	29 days	Tenth month	29 days
Fifth month	30 days	Eleventh month	30 days
Sixth month	29 days	Twelfth month	29 or 30 days

Occasional Thirteenth month

(Twelve lunations equal 354.37 days)

✧✧✧ *Chapter IV*

WHERE FLOWS THE NILE

It flows through old hushed Egypt and its sands,
Like some grave mighty thought threading a dream.
—Leigh Hunt

HISTORY'S oldest fixed date, 4236 B.C., marks an epoch-making development in the calendar. This was the year when Egypt accepted the sun as the central influence in Time measurement. Its astronomers and wise men had developed a remarkably accurate solar calendar, the adoption of which is the first recorded event in the annals of the human race. By a bold enactment the calendar became completely separated from all lunar reckonings; moon-months were abandoned and the month became an inde-

pendent time unit, a convenient subdivision of a twelve-month solar year.

Professor Henry W. Breasted, the eminent American Egyptologist, was the first to call attention to the significance of this event, which he described as "the earliest date in the intellectual history of mankind." The Swedish historian M. P. Nilsson had already assembled impressive documentation to show that "the Egyptian calendar was the greatest intellectual feat in the history of time reckoning." The underlying motives of this development, he indicated, were "practical convenience and utility, as well as astronomical accuracy."

The early Egyptians were a superior people, masters of mathematics and practical science. They carved out a time pattern which (with a few modifications) is still in use today, almost 6,200 years later. Its originators were fearless undaunted pioneers in the recording of Time, far in advance of other nations. For many centuries, the Egyptians enjoyed the greatest civilization of their day. Living under clear cloudless skies that were bright with sunlight by day and brilliant with starlight at night, their astronomers made close and constant observations of the movements of the sun and other heavenly bodies. The pyramids, erected as monuments to illustrious rulers, were astronomical observatories by means of which they could study the skies, observe the shadows cast upon the earth, and make painstaking records of heavenly phenomena which enabled them to analyze and foretell climatic and seasonal changes.

It was highly necessary for the Egyptians to know in advance the date of the annual overflowing of the life-giving River Nile, upon which depended the fertility of their soil. Their people, then as now, were predominantly agricultural. The area of tillable soil was so restricted and the density of the population so great that any failure to take full advantage of the inundation meant famine and distress.

The astronomers discovered that the annual Nile flood appeared simultaneously with the yearly appearance on the morning horizon of Egypt's brightest star, Sirius or Sothis—the Dog Star. This occurred on the date which we know as July 19. The coincidence of the "three risings"—sunrise, the rising of Sirius and the rising of their great river—was an event of supreme importance to all Egyptians. The astronomers made it the basis of the calendar, for by a simple mathematical counting of days from the previous heliacal rising of Sirius, they could predict with sufficient accuracy the inundation of the Nile, and the whole nation could be prepared for it.

Their solar calendar had twelve months each of 30 days, making a year of 360 days. The months, mystically identified with the twelve constellations along the celestial equator (the Zodiac), were each subdivided into three "decads" of ten days. The arrangement of 36 decads within a year of twelve 30-day months is considered the source of the 360-degree circle

and its subdivisions, still used for measuring angles, by mathematicians, surveyors and navigators.

The Egyptian astronomers were of course aware that a 360-day year was too short and did not fully agree with the seasons. They corrected this discrepancy by adding five "extra" days at the end of every year as special feast days. This gave the year a total of 365 days, which was fairly accurate. Thus the Egyptians were not only the first people to adopt a solar calendar that recognized the seasons, but also the first to acknowledge the year as a complete and integrated unit of Time, within which the intermediary time units fitted perfectly.

Thomas Mann in his trilogy on Joseph tells in his first volume how this young Israelite was brought to Egypt and became fascinated with the "mystery of numbers" and the "divineness residing in measure." He learned that the stations of the Zodiac were twelve in number, that the "moon number" was seven. He pondered on the mystery of the solar calendar of 360 days, supplemented by the annually inserted five-day period which brought the year to the necessary 365 days. He marvelled at the order, harmony and satisfaction of the calendar.

Egypt flourished under the stimulus of its newly organized civil time system. A primitive country with an unreliable economy became powerful and prosperous. Famines were less frequent. The way of life became simpler, easier and more orderly. Professor Breasted tells us that the adoption of the solar calendar "was the beginning of a great movement which carried over the thought of man from the world of nature to the world of human life." It was an epochal step in the social and civil development of man that called for an audacious act of vision and conviction—but honest conviction always calls for audacity and courage.

Comparing the Egyptians with other nations of the same period, it has been observed that "when they discarded the lunar calendar and accepted the solar standard they gained a broader outlook and the beginning of a world awareness."

This was strikingly apparent when about 1365 B.C. there appeared a remarkable ruler named Akhenaton (Ikhnaton). Under his dynamic rule, man began to feel a thrill of universalism. He was "the first prophet of internationalism," the first Egyptian to believe in a universal God for all mankind—the shining sun-god, the light of the world, to whom all creatures

---

Egyptian Calendar: Every Month the Same

First Decade:	1	2	3	4	5	6	7	8	9	10
Second Decade:	11	12	13	14	15	16	17	18	19	20
Third Decade:	21	22	23	24	25	26	27	28	29	30

(Five additional days added at the end of every year)

and races of man belonged. His great hymn to Aton, the Sun, has come down to us in the 104th Psalm:

O Lord, thou art very great,
Thou art clothed with honor and majesty
And robed with light as with a garment
Thou hast stretched out the heavens like a tent
And made the clouds thy chariot,
The winds thy messengers, fire and flame thy ministers.
Thou dost cause the grass to grow for the cattle
And plants for the service of man,
That he may bring forth food from the earth.
Thou hast made the moon to mark the seasons
And the sun knoweth its going down.
Thou makest darkness and it is night;
The sun rises: man goes forth to his work
And to his labor until the evening.
O Lord, how manifold are thy works!
In wisdom hast thou made them all:
The earth is full of thy creatures,
They all look to thee to give them their food in due season;
When thou givest to them, they gather it up,
When thou openest thy hand, they are filled with good things.
When thou hidest thy face, they are dismayed,
When thou sendest forth thy spirit, they are created,
And thou renewest the face of the earth.

Three thousand years after the adoption of the Egyptian time system, Akhenaton's emphasis on the spiritual significance of the sun gave new meaning to the solar calendar and the vital part it exerted in the development, prosperity and world leadership of his country.

Yet the astronomers had come to know that the Egyptian calendar was not perfect. They had learned that the solar year was actually a quarter of a day longer than 365 days. Because of this discrepancy the time-star Sirius arose a day late every four years, so that eventually the Egyptian calendar revolved entirely around the solar year. Of course the priestly astronomers allowed for this error in their calculations of the seasons and in their predictions of the Nile floods. But it was an awkward arrangement.

To remove this incongruity, Ptolemy III in 238 B.C. decided to set the calendar right with the seasons. His proposal was to insert an additional day every four years to the group of the five year-end feast days. He ordered the change in an edict preserved on the famous Canopus Stone (discovered in 1886), in which he quaintly dedicated the extra day every four years to the "Good Doing Gods."

Notwithstanding Ptolemy's staunch support, the plan was defeated. Old custom was too firmly entrenched. The influential priest-astronomers opposed it as an encroachment on their prerogatives and the public through apathy and indifference let them have their way. Thus progress was thwarted and an illogical and unscientific pattern was perpetuated.

Two centuries later, Ptolemy's rejected proposition was enthusiastically adopted by the Roman ruler Julius Caesar, and the extra day became the quadrennial leap-year day in a more accurate solar calendar that immediately went into international operation throughout the far-flung dominions of the Roman Empire.

✧✧✧ *Chapter V*

RENDER UNTO CAESAR

> Methods of measuring time grew up about the need for determining the dates of the tabooed or holy days, and for fixing and recording the occurrence of unusual natural phenomena which were believed to have some regular significance. . . . The perfection of the methods of measuring time has been a gradual transition 'from luck to mathematics'.
>
> —Harry Elmer Barnes

OF ALL bizarre and primitive calendars, that of the early Romans reached the height of absurdity and confusion. It was an old tribal system, inherited by the legendary first ruler Romulus when he founded Rome in 753 B.C., later recorded as 1 A.U.C. (anno urbis conditae). This calendar consisted of ten lunar months, beginning with the spring moon in March and ending about 300 days later in December. The period between December and March was disregarded, being an interval of little importance because "nothing happened" during those slumbering cold dark 60 days.

In keeping with an ancient custom the origin of which had long been lost, the months were divided into three sections known as Kalends, Nones and Ides, each of different length. The word Kalends, meaning a "calling" or announcement of a new month, gave us the word *calendar*.

Romulus lived 34 centuries after the Egyptians originated and founded their remarkable solar calendar. It is one of the ironies of history that the early Romans had no knowledge of this achievement, which eventually they had to blend into their own system, but only after many centuries of struggle with their primitive tribal heritage.

The ten-month calendar was hopeless, having none of the elements of stability and regularity that a satisfactory system of time measurement requires. Romulus did nothing about it, probably because he was without knowledge of mathematics and astronomy. His successor, Numa Pompilius, was more intelligent and scholarly, fully recognizing that the calendar needed improvement. In his long reign of 53 years he had ample time to become a constructive calendar reformer.

He increased the number of months from ten to twelve by adding January and February. The months were still lunar in character, their lengths alternating between 29 and 30 days. This gave the year 354 days but as the total was an even number and to the Romans this was unlucky, an extra 355th day was added at the end of the year.

Numa was advised by his astronomers that the extra 355th day would not be sufficient to agree with the seasons—which were important not only in agriculture but in military operations as well. To overcome this defect, Numa did what other calendar-makers have done, he inserted an additional thirteenth month every two years, calling it Mercedonius (from the Latin word for wages, indicating that it meant extra remuneration). This "remunerative" month of 22 or 23 days was arbitrarily thrust into the calendar toward the end of February, after the 23d, when the newly inserted month began. When it was finished, the remaining five or six days of February carried on. Of all the complicated man-made calendar adjustments in history, this was certainly the most fantastic.

Realizing that the awkward thirteenth month needed some authoritative supervision, Numa assigned it to the Pontifex Maximus, head of his newly created College of Pontiffs. He failed to realize that this would lead to all kinds of abuse—that the occasional 13th month would become a "political plum" which clever and unscrupulous officials could manipulate for their own purpose. By lengthening or shortening the intervals between intercalations, friends could be kept in power, enemies removed, dates advanced or postponed and all kinds of shady schemes promoted. And that is just what happened. Through the years such tampering with the calendar caused it to fall into chaos. The original intent to keep the calendar in line with the seasons was lost, so that in the first century B.C. the spring equinox had strayed from its place by about three months.

Meanwhile there had been other efforts which violated the calendar. About 300 B.C. a lawyer-politician named Cneius Flavius persuaded the people that all the months should have an odd number of days in order to make them lucky. February was the only exception; being the last month of the year it was unlucky, so it was shortened to 28 days. The result:

Lunar Calendar before Julius Caesar

March	31 days	7th month (September)	29 days
April	29 days	8th month (October)	31 days
May	31 days	9th month (November)	29 days
June	29 days	10th month (December)	29 days
5th month (Quintilis)	31 days	11th month (January)	29 days
6th month (Sextilis)	29 days	12th month (February)	28 days
			355 days

The intercalary month Mercedonius—22 or 23 days—was inserted every two years before the last five days in February to adjust the lunar year to the seasons. A

Flavian cycle of four years had 355, 378, 355 and 377 days, giving an average of 366¼ days, or one day in excess of the seasonal year. If this had been meticulously followed from the time of Flavius to the time of Caesar, the Roman calendar would have been about 250 days out of step with the seasons, but actually the observance of the Flavian rules was irregular and indefinite, and historians have difficulty in assigning correct dates to historical events in these years.

Another political interference with the calendar came in 153 B.C. when the beginning of the year was changed from the spring equinoctial date to January 1st. The new date had no scientific or seasonal significance, but was the appointed time for newly elected consuls to assume their civic duties. The populace considered this event as appropriate for the beginning of a new year so that, first by custom and later by official enactment, January 1st became the new year—a political date.

One of the incongruous results (which is still with us) was that the month named Quintilis, or "fifth," actually became the seventh month: and so with all the other numbered months—Sextilis, September, October, November and December. Romans were so keenly conscious of this absurdity that it became a pastime of the emperors to re-name the six numbered months according to their individual whims. September was known at various times as Germanicus, Antoninus and Tacitus; November was Domitianus, Faustinus and Romanus. Fortunately none of these names lasted very long.

Julius Caesar was the great reformer who made the Roman calendar the standard of the Western world. He had experienced the irregularities and difficulties of the Roman system while he was a military commander in Gaul, so that when he arrived in Rome, calendar revision was one of his chief concerns. While in Egypt, he had learned about that country's superior solar calendar, which caused him to appoint the Greek astronomer, Sosigenes of Alexandria, to be his chief adviser in revising the Roman system.

Caesar's authority to deal with this matter came through his election to the post of Pontifex Maximus in 63 B.C. After extensive studies, he put his new reform into effect in 45 B.C. The preceding year, 46 B.C., was one of the biennial periods which included the inserted month of Mercedonius. It became known as the "Year of Confusion." Caesar took the 355-day year with its inserted Mercedonius of 23 days and then added two more months making it 445 days long, a drastic operation which brought the calendar into step with the seasons. (The two added months were Undecember, 33 days, and Duodecember, 34 days.)

Then came the year 45 B.C. and with it Caesar's new time-plan. He was wise in accepting without hesitation the Egyptian solar year of 12 months, with two changes. He distributed the last five days of the year (a festival period in Egypt) more evenly throughout the calendar, and he

adopted Ptolemy's previously rejected extra leap-year day ("Good Doing Gods") by adding it to February every four years. The calendar was fixed at 365 days in ordinary years and 366 days in leap years. In recognition of this outstanding reform a grateful Senate honored Julius Caesar by renaming his birth-month Quintilis, July.

As compared with the Egyptian system, Caesar's adaptation was a considerable improvement. The reduction of the intercalary period from five days every year to one day every four years lifted the Roman calendar into a new level of efficiency and convenience. It was obvious to the scholarly Sosigenes that the shorter the period of intercalation, the better the calendar.

The new leap-year day was inserted after the 23d of February, where the 13th month of Mercedonius had been previously intercalated. Thus the 24th of February—in Roman terminology "the 6th day before the Kalends of March"—was repeated in leap years and became a double-six or bissextilis. This is the origin of the term bissextile given by Europeans to the leap-year day. Speaking historically, the added day in our present leap years is actually the old "double" 24th of February—which makes the month 29 days long instead of 28.

Two Latin historians, Censorinus and Macrobius, explain the operation thus: "To the old calendar of 355 days Caesar added ten days in order to make it a solar calendar. To January, March, May, Quintilis (July), Sextilis (August), October and December he gave each 31 days; and to April, June, September and November each 30 days. But February, the unlucky month of Terminalia, was left unchanged, "so that the religious rites of the gods of the nether world might not be disturbed." In this manner Caesar gave to seven months 31 days (the lucky odd number) and to four months 30 days (the unlucky even number).

The arrangement of the 31-day and 30-day months was not as regular and simple as it might have been, but presumably this did not particularly concern Caesar. We are historically quite certain that the arrangement of the months was as we have it today.

A different version of his calendar plan was published in the 1830 edition of *Encyclopedia Britannica,* and gained wide currency before it was disproved many years later by the evidence of newly discovered inscriptions. This theoretical reconstruction of Roman history suggested that Julius Caesar set up an improved arrangement of the months, with alternating months of 31 days and 30 days, and that his arrangement was altered by his successor, Augustus, in order to give August as many days as July. The reason for the change, said *Britannica,* was Augustan vanity.

But such a foolish gesture of vanity is out of character in one of Rome's greatest and most far-sighted emperors, and the accusation against him was rejected when Italian archeologists uncovered monuments with inscriptions

clearly showing that Sextilis had 31 days before it was renamed August.

Caesar did not pretend to have given the world a perfect calendar. All he claimed was that his plan was a great improvement on what had gone before. He established a solar calendar that recognized the seasons within a fixed and complete year, a worthy follower of the more ancient Egyptian solar calendar.

He did not disturb the awkward division of the months into Ides, Nones and Kalends, although he must have been keenly aware of the superiority of the Egyptian arrangement of subdividing the months into three decades. Nor did he change the beginning of the year to a seasonal point, the spring equinox or the winter solstice.

This latter improvement he had clearly in mind, but he was deterred from carrying it out because in 45 B.C. the first of January occurred on the new moon—and it was the new moon, still in high favor with a superstitious populace, that made him compromise and leave the New Year alone. Many astronomers and historians have pointed out certain advantages that would have resulted had Caesar placed the beginning of the calendar year on a really scientific basis.

Perhaps Caesar would have carried his reform further had he lived longer. He was assassinated on the Ides of March, a few months after the new calendar came into use.

During the years that followed, the unfamiliar leap-year rule was misinterpreted by the College of Pontiffs. Instead of inserting an extra day every four years, they observed leap year every three years. This caused the calendar once again to shift from its seasonal moorings, and it was Caesar's nephew, the Emperor Augustus, who undertook to correct the error. He cancelled all leap years between 8 B.C. and 8 A.D., and directed that thereafter all leap years should fall as originally intended. Once again the Roman Senate gave honor to a calendar reformer by renaming Sextilis, August.

This pattern continued to be observed until it was readjusted in 1582 by Pope Gregory XIII.

Calendar after Julius Caesar
(Solar Year of 365¼ days)

January	31 days	July (Quintilis)	31 days
February	28 or 29 days	August (Sextilis)	31 days
March	31 days	September	30 days
April	30 days	October	31 days
May	31 days	November	30 days
June	30 days	December	31 days
			365 or 366 days

✧✧✧ *Chapter VI*

CONSTANTINE AND THE WEEK

Upon the first day of the week, the disciples came together to break bread.
—Acts 20:7

CONSTANTINE, a Roman Emperor who has been called "a great historical phenomenon," was a constructive statesman of boundless energy and daring, who saved a tottering empire and gave it a new lease of life. He came to the throne from distant Britain, where his father had set up a capital at York to govern the tributary provinces of Western Europe, including the areas which are now France, Spain, Germany, Scandinavia and the Low Countries.

His interest in the calendar came by way of his tolerant attitude toward the Christians, who were a valuable part of his military and civil personnel. In Rome, the Diocletian persecutions of the Christians had reached a climax of inhuman cruelty, but Constantine was never a participant. Boldly taking the opposite side, he marched into his decisive battle against Rome with the cross of Christ on his banners and an inspired motto that "by this sign you will conquer."

As Emperor, he did not make Christianity the sole religion of the state. To the end of his days, he bore the title Pontifex Maximus as chief priest of the ancient pagan Roman hierarchy. But at the same time he gave Christianity complete equality with the traditional official worship. The coins which he issued carry both the cross and the images of Mars and Jupiter. Personally, he leaned more and more toward the Christians and on his death bed became one of them.

He had always been impressed with their ideas about the calendar. He liked their observance of a seven-day week, with the *first day* set aside as a day of rest and worship. The week was a complete novelty to the Roman calendar, which had its months subdivided into the impractical Nones, Ides and Kalends.

Nine years after Constantine became Emperor he issued an edict introducing the seven-day week into the Julian calendar. The weekdays had no names but were known only by numbers. The week displaced the old Kalends, Nones and Ides, and eventually the days acquired the names of the seven important heavenly bodies—Sun, Moon, Mars, Mercury, Jupiter, Venus and Saturn.

Unfortunately, Constantine in introducing the week did not give the

matter the full scientific consideration it deserved. He did not realize that he was removing from the Julian calendar the *perpetual* characteristic which had been one of its chief merits. Julius Caesar had established a calendar that was exactly the same year after year; even the bissextile observance in leap year did not disturb the perpetuity of the calendar. But now, with the new seven-day week gradually gaining outstanding importance in time-measurement, the Roman calendar lost this desirable perpetual feature. The weekdays rotated, and every year became different from the preceding and following one.

The change must have been annoying to the Romans and all their satellites, from Britain to India, because the monumental permanent calendars which had been erected in every part of the empire—carved in stone—had now become useless. In adopting the week, the imperial authorities had not given any consideration to the fact that 52 1/7 weeks within a 365-day year would involve difficult adjustments and recurring confusions. They carelessly thought of the year as 52 weeks; but the period of 52 weeks was always short a day to complete a true solar year—so at the end of each year a day must be borrowed from the first week of the next year. The New Year could never begin consecutively on the first day of the week. The convenient perpetual calendar was lost.

Had Constantine foreseen the effect of his action, he probably would have made adjustments. The device of intercalation was familiar in many regional calendars of the contemporary world; for example, in Egypt, Greece and Palestine. He might easily have hit upon the idea of a supplementary day without a weekday name, and thus he could have preserved the entity of the year which had been so carefully maintained in the Egyptian and Julian systems.

Thus the wandering week became the chief difficulty with the calendar, a serious defect that has continued ever since, and one that will be remedied at long last with the adoption of The World Calendar.

The origin of the week is historically a question that goes back further than any existing record. It was introduced into Palestine from the Assyrians, who used the seven weekdays as symbols for the seven heavenly bodies which were the basis of their astrology. The astrological belief was that each hour of the day was governed by a different "planet," in the order of their supposed distance from the Earth—Saturn, Jupiter, Mars, Sun, Venus, Mercury and Moon. The "planet" which governed the first hour of the day was called its *Regent*. If the Sun is regent for the first day, then the regents for the following days are: Moon, Mars, Mercury, Jupiter, Venus and Saturn—the same order of days that we observe in the week today. (In the Teutonic languages we have replaced the midweek deities with their counterparts—Tiu, Woden, Thor and Freya.)

But further back than the Assyrians, it is probable that the seven-day

week was related in the earlier lunar calendars to the four phases of the moon, each about seven days in duration. Actually there were several kinds of "weeks" used in ancient times. The early Romans observed an eight-day market week; other tribal and primitive people had market weeks of four, five or six days; the Egyptians and Greeks divided their months into ten-day periods.

Whatever its origin, the week with its one day of spiritual observance has proved itself a highly valuable time unit of profound significance and real benefit to the human race. Through Constantine's decree the week received its right beginning Sunday, observed by the Christians in commemoration of the Resurrection and the right ending Saturday, honored by the Jews and Seventh-Day Adventists as the sacred day of rest, with Friday, the religious day of the Moslems, the Hegira, when Mohammed was forced to flee from Mecca. Even those for whom the week has no religious connotation would not think of abandoning the week, an interval of Time that fits perfectly into the spiritual and practical living of peoples everywhere. The inherent benefits of the day of rest and worship are universally recognized. Mankind and the calendar are enriched and ennobled with its observance.

Constantine's Introduction of the Week
in 321 A.D. changed the stable Roman Calendar (every year the same) into a variable system, in which every year was different:

January 321

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

January 322

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

January 323

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

January 324

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

January 325

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

January 326

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

These presentations of the calendar in Constantine's time are, in a sense, merely theoretical. The division of the months by Ides, Nones and Kalends was dropped during the Middle Ages.

✧✧✧ *Chapter VII*

GREGORY'S CONTRIBUTION

> The time is out of joint; O cursed spite,
> That ever I was born to set it right!
> —Shakespeare

AFTER Constantine, 1,250 years passed before there came another change in the calendar. It was in 1582 that Pope Gregory XIII undertook the revision which is now in general use.

In the intervening medieval centuries (between the fifth and sixteenth) there were a number of important events which had a lasting impact upon Western civilization. The reign of Charlemagne in the eighth and ninth centuries brought together in a new unity many of the Northern peoples of Europe. The Arabic contributions to the West in the fields of science, mathematics, art and education reached their peak in the tenth century. The Norman invasion in the eleventh century thrust the islanders of Great Britain into the European arena. The eight Crusades between the eleventh and thirteenth centuries gave Europe a closer contact with the Near East. The Magna Carta of the thirteenth century freed Englishmen from feudal lords and barons. The Gutenberg printing press of the fifteenth century led to a broader dissemination of learning. The discovery of America in the fifteenth century stimulated almost every phase of human activity in the Old World. The Reformation of the sixteenth century lifted men's conscience from the domination of state religions. Everywhere there were driving forces urging mankind forward toward new freedoms, broader knowledge and greater unity.

The calendar of Caesar and Constantine, with its irregularities and deficiencies, could not escape these forces. As early as the thirteenth century there were scholars and public officials who complained that the calendar year was drifting away from the seasons, because under Caesar's four-year rule too many leap years had been inserted. The resultant difficulties were repeatedly called to the attention of rulers and popes, but nothing was done until the latter years of Gregory's occupancy of the pontifical throne.

The aging Pope, weary of wars and public works and financial difficulties, turned his attention at last to the calendar. Aided by a notable staff of scientists, he analyzed the problems. *First*, how could the year be brought back into accord with the seasons? *Second*, how could the leap-year rule be corrected to stop further dislocation? *Third*, could the beginning of the year be set in a fixed position, instead of being observed at different times

by different peoples? *Fourth*, could anything be done about the wandering Easter, a cause of considerable inconvenience?

The Easter question was actually the source of the Papal intervention. Easter was a spring festival, but the "drifting" of the calendar had been gradually pushing it further and further away from the spring equinox. Eventually, if not corrected, Easter would be arriving in the winter, and this would correspondingly dislocate all the other important feasts which depended on it. Julius Caesar had kept the equinox on the ancient date of March 25th; in Gregory's time it was falling on the 11th.

The error in Caesar's leap-year rule was readily understood. The Roman Emperor had figured the solar year at 365¼ days. Actually it takes the earth but 365 days, 5 hours, 48 minutes and 46 seconds to complete its annual journey around the sun. The true year is thus 11 minutes and 14 seconds short of six hours—a quarter of the 24-hour day. This slight difference, accumulating through the centuries, had been sufficient to put the calendar 14 days off balance with the seasons.

Pope Gregory and his scientists decided to deal with the first of their four calendar problems by dropping a certain number of days from the year 1582. On the question of "How many days?" they worked out a compromise. Not the full 14 which would have brought things back to Caesar's formula, but only ten days, which adjusted the equinoctial date to March 21st, where it had been observed at the time of the first Christian conclave at Nicea in 325 A.D. The use of Nicea as a starting point gave an ecclesiastical touch to the whole operation.

As to Problem Number Two, the new leap-year rule, skillfully formulated by the Pope's advisers, related only to century years. Those which were divisible by 400 were to be leap years; all the others were to be ordinary years, such as 1700, 1800, 1900. The years 1600 and 2000 are leap years. Outside of centurial years, all the other years keep to the simple four-year rule as prescribed by Caesar. Thus three leap years are dropped out of each 400 years, and this simple formula will keep the calendar approximately correct with the seasons for about 3,300 years.

Problem Number Three was concerned with a stable New Year's Day. For many centuries, the New Year had been the most wayward of anniversaries. Julius Caesar had accepted January 1st, but in the sixth century the Church had adopted March 25th, the Feast of the Annunciation, which mystically recalled the birth of Christ. During succeeding centuries, this was a widely observed date, although all kinds of variations occurred from time to time. Germany and Spain thought the year should begin at Christmas, Denmark used an August New Year's Day, France and the Netherlands observed Easter. In Venice the date was March 1st, in Ireland February 1st.

To remove all the confusion Pope Gregory came out firmly for Janu-

ary 1st. He ignored the pagan origin of this date, and gave it ecclesiastical standing by pointing out that it was the Feast of Circumcision in the church calendar. His scientific advisers probably pointed out that the first of January had a certain astronomical basis: the "perihelion" occurs on or about the beginning of January, when the earth is closest to the sun—being 91,500,000 miles away, as against 95,000,000 miles six months later.

Then there was the question of stabilizing Easter. The wandering character of Easter is due to the fact that it is tied to a lunar reckoning; theoretically Easter comes on the first Sunday after the full moon following the spring equinox. Here is a basic contradiction. The civil calendar goes by the sun; the religious feast day Easter is reckoned by the moon. No compromise is possible, for the result must be either one thing or the other.

There appears to be no reason why Easter cannot be observed on the Sunday nearest to the historical date of the Resurrection, presumably April 9th. Gregory and his advisers attempted no such change. They left Easter as it was, and the result is a wandering festival which causes great inconvenience in countries where Easter is important in civil life.

The Gregorian revision went into effect immediately in 1582 in all Roman Catholic countries. Ten days were dropped from October: Thursday, October 4th, was followed by Friday, October 15th.

Outside the strictly Roman Catholic countries, there were long delays in recognizing the scientific advantages of Gregory's proposals. Protestant Germany and Denmark adopted the new calendar in 1700; Great Britain and the American colonies in 1752, Sweden in 1753. Japan in 1873, China in 1912. Russia and the Eastern Orthodox countries were tardiest of all.

The hesitancy of the Northern nations to accept the Gregorian reform was due to the violent religious prejudices which had followed, aroused by the Reformation. In the Eastern Orthodox area, too, the scientific nature of the reform was minimized and the priesthood feared that acceptance would be interpreted as a quasi-allegiance to a faith different to their own.

In other parts of the world, particularly in the Asiatic countries, the new system was labelled the "Christian Calendar" and its name created resistance among Hindus, Moslems, Buddhists, Taoists and other powerful groups.

These unfortunate reactions had not been foreseen by Gregory XIII and his advisers, who had expected that the revision would be accepted as a sound scientific action, without religious connotations. It did not work that way. For more than a century, his calendar was held up as a symbol of Papal domination, and this caused the Roman Catholic Church a considerable amount of annoyance and trouble. It is one of the reasons why, in the present age, the Vatican has been reluctant to take any *initiative* in the movement for a further improvement in the calendar.

The Gregorian reform was good up to a point. It anchored the calendar

into the seasonal year from which it never should have strayed, and it established a uniform practice as to the year's beginning. However, it failed to touch Caesar's faulty arrangement of months, quarters and half-years; and it did nothing to harmonize the wandering weekdays which were an inheritance from Constantine. These two faults are becoming increasingly burdensome with the development of civilization and the requirements of our modern world.

There is no doubt that Gregory's able scientific advisers pointed out these defects. Such competent men as Lilius, Clavius and Scalliger could not have failed to realize the situation. The Pope's viewpoint, however, was strongly ecclesiastical: his primary concern was to make certain that the inconveniences of the church calendar were remedied, and he may have felt that any further action would endanger the simpler program he had in mind.

The Gregorian reform left the calendar still inadequate. There was no regularity in the arrangement of the months; the quarter-years varied from 90 to 92 days in length; the half-years were ridiculously unequal. The weekdays continued to wander from year to year, so that people actually had to use 14 different calendars and 28 different kinds of months. A new calendar had to be prepared and printed every year. The order, stability and comparability which only come when the year is one complete unit, such as the Egyptians and Julius Caesar had installed, were totally absent. The ideal of a perpetual and balanced measuring system of Time had to wait until the present twentieth century, when the pressures of science, business and a need for world unity would make imperative a further scientific simplification and perfection of the civil calendar.

It is a remarkable historic coincidence that at the very time when Gregory was wrestling with European calendar problems, the same sort of thing was happening in India. That faraway country was enjoying the beneficent rule of Akber, greatest of the Mogul (Mongol) emperors and one of the most eminent royal personalities of all time. Much of his work of consolidation and organization in India survives to this day—and part of it involved an effort at unifying the Indian calendars.

Although Akber was unquestionably the greatest world figure of his century, he had to live within his limitations. One of these handicaps was that he knew practically nothing about the Western world except through a few contacts with Jesuit missionaries. His religion was a narrow form of Mohammedanism, which was a minority sect in India—even then a kaleidoscope of religions. In searching for an improved calendar, he never thought of consulting Europe and probably never heard of the Gregorian reform of 1582. Instead, he turned to Persia and its Jelali solar calendar, which he brought to India in 1584. It was one of the best of all solar calendars, with an even better approximation of the actual astronomical year than the Gregorian system.

Unfortunately Akber's reform measure was misunderstood, and after his death, in the absence of any central guidance, it became combined with ancient errors and local variations. Thus his main purpose of providing a national calendar was defeated. But it was a worthy attempt, and the broad vision which inspired it has always been recognized in India, and is indeed the foundation for the present movement under Nehru's leadership.

The world of today would be a better world had Akber and Pope Gregory joined forces in the 1580s. They would have emerged with a worldwide calendar, which would have drawn together the East and the West; and the result would have been a powerful vehicle for international cooperation and understanding, an ever-present antidote for narrow sectarianism and isolationist nationalism.

Gregorian Calendar
(Weekday arrangement varies each year)

January	31 days	July	31 days
February	28 or 29 days	August	31 days
March	31 days	September	30 days
First Quarter	90 or 91 days	Third Quarter	92 days
April	30 days	October	31 days
May	31 days	November	30 days
June	30 days	December	31 days
Second Quarter	91 days	Fourth Quarter	92 days

(First half-year 181 or 182 days; second half-year 184 days)

✧✧✧ *Chapter VIII*

DEVELOPMENTS IN ISRAEL

Day unto day uttereth speech, and
night unto night showeth knowledge.
—Psalm 19:2

TWO ancient calendars still influence our civilization, the Egyptian and the Jewish. Egypt gave us the solar seasonal year, establishing it on a sound astronomical basis which is the foundation of our present Gregorian system. The Jews gave us the week, with the deep spiritual satisfaction of a regular seventh day consecrated to rest and worship, now increasingly observed throughout the world.

The Jewish calendar in its entirety still survives among the Hebrew

people and is the official civil system of the new state of Israel. Historically it is the result of a long series of revisions and adjustments, with important lessons for modern students of calendar reform.

The principal features of the Jewish calendar as it exists today are: It reckons the years from 3761 B.C. (October 7 at 8:11 o'clock), a conventional starting point representing the Creation; it regards the day as beginning at sunset, which for convenience is supposed to be 6 p.m., Standard Time (but in Jerusalem it is Jerusalem time, 2 hours and 21 minutes off Greenwich); the New Year comes in the autumn, either in late September or early October; the years consist of 12 months of alternating 29 and 30 days, with a 13th month inserted seven times in every 19 years; the Sabbath is observed at the end of the week, starting at sunset on Friday and continuing until sunset on Saturday, when a new week begins; until recently, the Jews had their own method of subdividing the hour into 1080 "parts" and each of these parts into 76 "moments"; the names of the months are of Mesopotamian origin and some of them perpetuate pagan deities.

The evolution of this calendar system has been intensively studied for many centuries, although the basic historical material is often fragmentary and incomplete. However, it is clear that the earliest Jewish calendar was purely lunar, with 12 months of alternate 29 and 30 days. With advancing civilization came the need for putting the lunar calendar into a seasonal pattern. As with other ancient peoples, a 13th month was intercalated in various ways, often at the whim of rulers or religious leaders. Strangely, the Old Testament does not mention any intercalated month or its equivalent.

The months at first were numbered, but eventually they took on the Babylonian names, which they still bear today. The intercalated 13th month was taken over from the Babylonians but the method of inserting it and the order of the occasional 13-month years was a matter of slow and gradual development over a period of many centuries.

Actually, the present-day rule for inserting the 13th month was not formulated until 358 A.D., when Rabbi Hillel II devised a permanent program on the basis of a 19-year cycle, wherein the seven years of 13 months are the 3d, 6th, 8th, 11th, 14th, 17th and 19th. The thirteenth month follows the month of Adar and is called Veadar or Adar-Beth.

In current practice, the 12 "ordinary years" of the 19-year cycle may contain 353, 354 or 355 days, known respectively as common deficient, regular and abundant years, whereas the seven "leap years" may contain 383, 384 or 385 days, the embolismic deficient, regular and abundant years. Thus the Jewish years are of six different lengths.

In the days of Moses in Exodus, the year began in the spring month of Abib (subsequently called Nisan). This was changed later to autumn and the month of Tishri. In the period of the Patriarchs, the day began at sunrise. This was changed to sunset during the fourth century B.C.

There were equally drastic changes in the observance of the week. The early history of the Jewish Sabbath and the seven-day week is somewhat obscure. Predecessors of the ancient Jews (for example, the Chaldeans) considered the 7th, 14th, 21st and 28th days of the month as of ill omen, unsuitable for important enterprises, so that men feared to work on those days. The Hebrews observed these seventh days as days of rest, bestowing on them a spirit of sanctity and removing all associations with evil.

This conception they added to the Canaanite solar calendar which was in use by their neighbors, along with their own tribal festivals. But in that stage of civilization, calendars were not too definitely fixed or anchored. Changes were made to fit emergencies, and the prevailing system could be freely altered.

It is significant that in the first 65 chapters of the Old Testament, periods of seven days are frequently noticed; but after the narrative of the Creation, no Sabbath is mentioned until the great religious leader Moses speaks to his people in the desert. Obviously there had been no strict adherence to the Sabbath observance in former times. Moses established the sacred seventh day and gave it emphasis as a preeminent feature of religious life and worship, which he strengthened further when he made it one of his Ten Commandments.

His first effort to fortify the Sabbath observance came, according to Exodus, as the result of the miraculous gift of manna from Heaven. The manna was gathered every day for five days and a double portion on the sixth day; then the Hebrews were commanded to rest and worship on the seventh day. In this manner Moses gave his people a dedicated Sabbath endowing it with divine authority.

During the Mosaic era, a radical change in the calendar came into effect. "Pentecontad" periods of 50 days were devised. Each period contained seven weeks of 49 days that included seven Sabbaths, with an extra 50th day as a special "offering to the Lord," always observed as the closing day of each pentecontad period. This calendar was in use in Palestine for many centuries.

It was at a much later date, during the Babylonian captivity, that the pentecontad plan with its special 50th day was abandoned and a regular *invariable* seventh-day Sabbath was substituted, with the Babylonian luni-solar calendar as its background and framework. At this time the Jewish religious leaders formulated their theory of the "unbroken continuity of the seven-day week," maintaining that their new system had started with the Creation and emphasizing the divine origin of the Sabbath. The Sabbath for the first time became identified with the idea of the unbroken continuity of the weeks.

"It was in the Exile," writes Dr. Harry Emerson Fosdick in his *Guide to Understanding the Bible*, "that the story of creation was brought to its climax

in the admonition to keep the Sabbath, made sacred from the world's foundation. It was in the Exile that the laws were rewritten and codified stressing Jewish differentials."

Judaism from Babylon onward has maintained consistently its own religious calendar and its own concept of the unbroken continuity of the week. One of the foremost Jewish historians significantly points out, "The present Hebrew calendar is a direct heir of ancient Babylonia, just as the present Gregorian calendar is a direct heir of ancient Egypt."

Months of the Jewish Year

1 Tishri	30 days	7 Nisan	30 days
2 Heshvan	29 or 30 days	8 Iyar	29 days
3 Kislev	29 or 30 days	9 Sivan	30 days
4 Tebet	29 days	10 Tammuz	29 days
5 Shebat	30 days	11 Ab	30 days
6 Adar	29 or 30 days	12 Elul	29 days
Veadar or Adar-Beth (occurring only in leap years)	29 days		353, 354 or 355 days in common years 383, 384 or 385 days in leap years

✧✧✧ *Chapter IX*

REALM OF THE CRESCENT

I fear this iron yoke of outward conformity
hath left a slavish print upon our necks.
—John Milton

THREE hundred million Mohammedans—concentrated in a dozen countries of the Middle East and adjacent parts of Asia and Africa—still use a primitive lunar calendar, that was inaugurated in Arabia several years after the Prophet's death in 632 A.D.

Mohammed had thus no part in installing this calendar reform. It was done by his *Companions* in an effort to carry out what they thought was in his mind, guided by a single obscure passage in the Koran.

The pressing need for a Moslem calendar arose out of the surprisingly rapid expansion of Mohammedanism immediately after his death. In less than seven years the tribesmen of Islam swept the decadent Roman Empire out of Asia Minor and gained control of such remote and renowned cities as

Antioch and Damascus. Bound together by a fighting creed, they developed a strong conviction of invincibility. Their religious unity required formulation and stability.

To understand the background of their calendar, it should be remembered that Mohammed's public career was fairly brief: only 23 years elapsed between the day when he first appeared as a religious leader and the time of his death. His spiritual aim, as he stated, was a "restoration of the religion of Abraham," with emphasis on the unity of God and on the future life.

During his lifetime, the tribesmen around Mecca and Medina used a luni-solar calendar on the Hebrew pattern, in which a 13th month was intercalated every two or three years to adjust the lunar months to the seasons. Responsibility for the intercalation rested with a family of astronomers known as the *Qalamas*. The 13th month was placed at the end of the year.

The Arabs also observed an ancient religious custom, steadfastly adhered to, of having four sacred months—the first, seventh and the last two months of every year. The intercalation of a 13th month between two sacred months (the last and the first months) brought about a great deal of disturbance. Should the intercalary month be observed as another sacred period? Or should it be regarded as an ordinary month and allowed to interrupt the religious observances?

Mohammed experienced all this confusion, and being solicitous for the spiritual and physical welfare of his people he felt that the combination of intercalation and postponement led to error. It was a real tragedy to Islam that he did not live to clarify this situation. Possibly he was preparing to take up the calendar when death intervened.

Just before his death he proclaimed through a verse of the Koran: "Twelve months is the number of months ordained by God, according to God's book. . . . Any 'nassi' is the cause of confusion." Nobody knew exactly what the Prophet meant by the latter phrase. The word "nassi," translated by various authorities as *postponement*, *transferring* or *carry-over*, can hardly be translated as *intercalation*. But after him his *Companions* gave it that interpretation, and installed a purely lunar calendar.

Of course the "year" of twelve lunations and 354 or 355 days bears no relation whatever to the solar year. Therefore the Moslem lunar calendar wanders through the seasons and returns to its original position after a period of about 33 years. A Moslem who according to his calendar says he is 34 years old is actually only 33 years old by the Gregorian reckoning.

This purely lunar calendar led later generations of Moslems to strange dilemmas and inconsistencies, for the simple reason that while the lunar calendar may meet the requirements of the simple Bedouin living in desert isolation, it raises many difficulties when facilities of communication establish larger units of population.

For example, a new moon may be seen by one clan and not by another living ten miles away: the next day therefore becomes the first day of the succeeding month for the first clan while it remains the 30th day of the current month to the other.

To remove this anomaly the intellectuals of later generations, when the influence of Islam expanded, found themselves between the meanings ascribed to the word of God on the one hand and the clearly ascertained laws of God on the other. They were forced to prescribe that the first month of each year, Muharram, should be assumed to have 30 days and the second month 29 days and so on alternately throughout the year, except for the last month which in 11 out of 30 years has 30 days instead of 29.

They implied that this assumption was to hold good irrespective of whether the moon was seen on the 29th or 30th, but they did not dare to clarify this implication because it would go against the prohibition of intercalation *ascribed* to the Koran.

But the orthodox saw through this implication and refused to accept the formula. For them the length of each month of the lunar calendar consisted of 29 *or* 30 days, not alternately, but depending upon whether or not two reliable men had *seen* the new moon on the evening of the 29th or 30th.

In recent years scholars have been insisting that the interpretation forbidding intercalation is incorrect and that in all probability Mohammed intended the adoption of a twelve-month seasonal calendar of the type used by Rome and other Christian nations.

Whether Mohammed's immediate successors were right or wrong, they burdened all Islam with a strictly lunar calendar that has caused endless difficulties, sufferings and harassments.

One of the more important handicaps of the wandering calendar has been its effect on the annual Hajj or pilgrimage to Mecca. The rites of the Hajj, prescribing bare-headedness and the wearing of only two pieces of cloth, could only have been meant for a time of year when it was neither too hot in the day nor too cold at night. But, because the Hajj rotates in a lunar calendar through even the hottest and coldest months, thousands of pilgrims have suffered the rigors of the extreme climate of Saudi-Arabia.

In 1953 the annual pilgrimage, always in the twelfth and last month of the year, came in midsummer. Ahmad Kamal, in the *Saturday Evening Post*, wrote that the heat ranged between 116 and 127 degrees, and on one day the mercury climbed to 142 degrees, causing the death of 4,411 pilgrims on that day alone. And all this tragic loss of life was due to the non-seasonal moon calendar!

"It is obvious," writes Mohammed Ajmal Khan, "that the Prophet wanted the Muslims to follow the custom of the Christians in the matter of the calendar, so that the Hajj should fall in the month of March—near the Christian Easter, the Jewish Passover, the Iranian Navroz and the Hindu festival of

Holi. If this had been done, the Islamic message of peace and goodwill would have been better understood and there would have been no crusades, no bloodshed in the name of religion, and no ill-will in the name of Islam."

Another well-known authority, Dr. Hashim Amir Ali of Osmania University, says: "And there *are* really only twelve months in God's calendar ever since the earth began to revolve around the sun in its present orbit. The two solstices and the two equinoxes divide the cycle of the year into four periods and in each of these a season begins, reaches its zenith and declines —making twelve sub-seasons in all. These may be called by any name one likes. The Koran only emphasizes this fact in Nature—and man's incorporation of it in his calendar is a testimony of his attempts at abiding with God's creation."

These are matters which are of increasing concern to the Moslem religious authorities. But they do not fall within the province of the United Nations in its efforts to improve the present international *civil* calendar.

All Moslem countries use the Gregorian calendar in their international relationships. Its datings are widely employed in commerce, and most Arabic newspapers are double-dated. The Gregorian system is an alternative, generally recognized by law. The Moslem calendar is primarily for religious use; the Gregorian system is of course civil in its function.

Nobody at the United Nations has the remotest intention of touching in any way upon religious calendars, whether they be Christian, Jewish, Moslem or Hindu. Such changes, if they come at all, must be made by the properly constituted religious authorities.

The international civil calendar, however, is a matter on which all nations can agree. The Arab states are as interested as any others, in improving the present system, to give it greater accuracy, utility and universality.

A statement from a Moslem representative of the government of India says: "The universal calendar proposed by The World Calendar Association is very useful indeed, and no religious question arises against its adoption. The lunar calendar was proposed for all the religious functions of Islam because its knowledge is possible for everyone naturally. Muslims will carry it on for their religious purposes, but for all other purposes and especially for government administration, the new reformed calendar should be adopted."

Months of the Mohammedan Year

1 Muharram	30 days	7 Rajab	30 days
2 Safar	29 days	8 Shaban	29 days
3 Rabia I	30 days	9 Ramadan	30 days
4 Rabia II	29 days	10 Shawwal	29 days
5 Jumada I	30 days	11 Zu'lkadah	30 days
6 Jumada II	29 days	12 Zu'lhijjah	29 days*

* In leap year, 30 days

354 or 355 days

✧✧✧ *Chapter X*

CENTURY OF PREPARATION

New times demand new measures and new men;
The world advances, and in time outgrows
The laws that in our fathers' day were best.
—James Russell Lowell

MODERN calendar reform was initiated in 1834 by an Italian priest, Abbé Marco Mastrofini. In that year he published a scholarly book with the impressive title *Amplissimi Frutti da Raccogliersi sul Calandario Gregoriano Perpetuo*—which may be freely translated "Final Results of Research on Perpetualizing the Gregorian Calendar." The volume was fortified by the Church with three *Nihil Obstats* and two *Imprimaturs.*

The Abbé proposed a year of 364 days—beginning with Sunday, January 1st, and ending with a 365th "extra-calendrical" day, to be called *feria octava* (the holy day or the eighth weekday). In leap years there would be another extra day (to be placed either after February, as in the Gregorian calendar, or immediately after *feria octava*) which would be called "intercalary day." Mastrofini was thus the great pioneer for the one or two stabilizing days which calendar reformers subsequently have adopted.

A recent Catholic writer points out: "The only detail in which he did not anticipate proposals like the modern World Calendar was in regularizing the length of the months and making the quarters equal. But these are, after all, lesser details. Mastrofini originated the basic idea of all modern reform, the stabilizing days. For this momentous suggestion he has not been adequately honored by the world."

Fifteen years after the publication of Mastrofini's book, the great French philosopher Auguste Comte used the intercalary days in his plan for a 13-month "Positivist Calendar," as part of a vast scheme for human betterment.

In 1882 and 1884 the Mastrofini proposal was revived and enthusiastically advocated by Bishop Nicoro of Como and Abbé Croze of Paris, but without much public response.

In fact, no organized campaign for calendar reform developed until 1887, when the French astronomer Camille Flammarion, as president of the new Astronomical Society of France, initiated an ambitious contest for the most practical plan of calendar revision. The two prizes were won by slightly different 12-month proposals, both using Mastrofini's intercalary days.

The impact of the competition and the awards was world-wide. Flammarion had made an excellent beginning toward creating a universal interest,

but his own preoccupations in the astronomical field prevented him from the necessary follow-through.

The real impetus for an improved calendar did not come from either priests or astronomers, but from the world's leading business organization, the International Chamber of Commerce. This influential institution had been interested in the subject from its inception. In 1910, 1912 and 1914 (at its biennial conventions) it urged calendar reform in three successive resolutions, each one stronger than its predecessor. In 1912 it sent an inquiry to Rome, asking for a clarification of the Vatican's attitude, and received the following reply from the Papal Secretary of State: "The Holy See declared that it made no objection, but invited the civil powers to enter into an accord on the reform of the calendar, after which it would willingly grant its collaboration in so far as the matter affected religious feasts."

This reply was most significant, in that it clearly separated the civil calendar from the religious. The former was the responsibility of governments; the latter that of the churches.

The International Chamber's next action, in 1914, accepted the division of functions, and proceeded at once to obtain the official action necessary to enact an improved civil calendar. The Chamber (then the only existing top-level international agency) asked the Swiss Government to call a world conference for the purpose of adopting and legislating a reform which already had received unanimous approval in the unofficial channels of the business and scientific world. Switzerland accepted the invitation, and was preparing the material for the conference when World War I intervened.

After the close of the war, in 1919, the International Astronomical Union revived the subject. It formed a committee under the distinguished chairmanship of Cardinal Mercier of Belgium. His leadership made the creation of this committee an event of world-wide importance. The Cardinal had just emerged from World War I as a triumphant symbol of resistance to tyranny. He was highly regarded as both scholar and leader in England and in America, as well as in continental Europe. His advocacy of calendar reform drew many Catholics into the movement, and also commanded the attention of the Church of England.

The Cardinal's committee spent three years on its scientific studies, which culminated in a conference held in Paris in 1922. However the Cardinal subsequently resigned his presidential position because he felt himself not sufficiently equipped to deal with astronomical matters. A later meeting was held the same year in Rome, at which Professor Bigourdan of Belgium presided, with Abbé Chauve-Bertrand of the French Astronomical Society as secretary. The Abbé's interest in calendar reform continued to grow until he became one of the great Catholic leaders in this cause, highly influential by reason of his authoritative book *La Question de Pâques et du Calendrier.*

At the Rome meeting, the Astronomical Union's "Commission 32" approved the perpetual 12-month equal-quarter plan containing the one or two extra days and urged international adoption.

Science, government and business joined hands in the next stage of progress. The League of Nations was established in 1920, and was approached on the matter of an improved calendar in 1923. The Swiss Government, the International Chamber of Commerce and the International Astronomical Union all felt that calendar reform should have a place on the permanent agenda of the new international organization. Their suggestion was approved at Geneva, and the subject was allocated to the League's Section on Communications and Transit.

Now for the first time calendar reform was on an official basis in an international forum of governments. As an initial step, the League secretariat felt that it should clarify the division of authority between church and state —this seemed necessary because of pressure from several countries for stabilization of Easter, which obviously was an ecclesiastical matter. So a preliminary committee was appointed which included three ecclesiastical newcomers—the Reverend T. E. R. Phillips, secretary of the Royal Astronomical Society of London, representing the Archbishop of Canterbury; Professor Demetrius Eginitis of the Observatory of Athens, representing the Patriarch of the Eastern Orthodox Church, and Father Gianfrancheschi, president of the Vatican's Academy of Science, representing the Holy See.

The League of Nations, having confirmed through this group that the churches had no dogmatic objection to a reform of the civil calendar, proceeded to set up a "Special Committee of Enquiry" under the chairmanship of Professor W. J. M. Van Eysinga of the University of Leyden, Holland. Other members included the three ecclesiastical representatives, together with Professor M. G. Bigourdan, chairman of the International Astronomical Union's Committee on Calendar Reform, and Willis H. Booth of New York City, president of the International Chamber of Commerce. The committee was an excellent one, especially as the three ecclesiastical members were all scientists of high competence. Professor Van Eysinga was an enthusiastic advocate of calendar revision, with a thorough understanding of the international situation and the need of unification in order to facilitate communications and mutual understanding.

The special committee continued its studies throughout 1924, 1925 and 1926, when it submitted its final report. There was complete agreement on the need for an improved calendar, but the committee members had been unable to reach a decision as to the legal steps by which this was to be brought about. They felt the need for a more urgent "mandate" from governments, and they suggested that "public opinion was not yet prepared to press for action." Accordingly, their chief practical recommendation was

that all nations should be asked to set up committees to promote localized research. The ecclesiastical members of the committee added a formal statement reassuring the civil powers that "from the viewpoint of religious dogma the idea of calendar reform does not meet with difficulties of such a nature that they can be regarded as insuperable."

The vague statement that "public opinion was not prepared to press for action" seemed to call for explanation. Informally one of the committee members said: "We are convinced that this project needs a broader base of active support. We hope it can be obtained through the creation of national committees everywhere. This does not mean that we expect calendar reform to be forced upon the League of Nations by an aroused public demand. That would be asking too much. In the past, reforms of this character have always been imposed from above. If they had to wait for public opinion to insist, they would never be realized. This is historically supported by the records of the Julian, Constantinian and Gregorian reforms. Nevertheless, a certain preparation of the popular mind for calendar reform seems to us advisable and necessary."

The suggested national committees were eventually created by many governments, but in some instances their membership was composed mainly of minor officials. Generally they failed to carry out important educational activities, and were not very influential at home or in Geneva. Nevertheless, they served to accent the need for calendar revision.

In the United States an intensive campaign for calendar reform was conducted by George Eastman, the famous Kodak manufacturer. He had met with Moses Cotsworth of England, an ardent advocate of a 13-month plan who was successful in winning Mr. Eastman's support. A non-official committee, known as the International Fixed Calendar League, was formed in 1924 with headquarters in the United States, of which Mr. Eastman was the chairman. Mr. Cotsworth, director of the London office, was in charge of affairs in Europe. Although an able campaign was waged it never gained the full interest and support of the people. It won mild approval among statisticians and the business world because of its *seeming simplicity*, but the public at large did not respond to a plan that was arranged on so awkward a number as 13 and which involved many unnecessary and drastic changes.

However, real interest in an improved calendar had been aroused in the United States, with the result that in 1928 and 1929 the House of Representatives introduced joint resolutions requesting the President to propose the calling of an international conference on calendar reform, or to accept, on behalf of the United States, an invitation to participate in such a conference. All this led up to the League of Nations calling the first international calendar conference ever recorded in history. It was held in Geneva October 12, 1931, and lasted a week. It was the League of Nations Fourth General

Conference on Communications and Transit that dealt with calendar reform.

A year before the international conference a new calendar organization had been formed in the United States, The World Calendar Association, that advocated a revised 12-month calendar of equal quarters, with the perpetual feature originated by Abbé Marco Mastrofini. It conducted an intensive campaign, the purpose being to inform the people of the superior advantages of the 12-month revision.

In June 1931, a Preparatory Committee meeting was held in Geneva at which both the 13-month and the 12-month calendars were given a hearing, and both received a place on the agenda of the International Conference in October. The Preparatory Committee considered 187 plans and among those eliminated by the League were:

First, four long 35-day months and eight short 28-day months, "because the very perceptible inequality of the months would be extremely inconvenient from every point of view";

Second, a "Leap-Week Calendar" with an extra leap week every five, six, or eleven years would give three different lengths of years: 364, 371 and 378 days in order to keep the calendar in step with the seasons, rejected on the ground that it is "inferior to the existing calendar and cannot be considered at all";

Third, a decimal system;

Fourth, a five, six or ten-day week;

Fifth, plans for changing the date of the New Year to January 0 or Monday or a seasonal point.

Eliminating these plans expedited the discussion for the October conference, for which three were chosen: the Phillips plan that regularized the months but was without the perpetual feature, the 13-month plan and The World Calendar. The first was rejected because it was an insufficient reform, while there was an equal number of votes for the other two. The 13-month plan received the support of Canada and Yugoslavia; and Switzerland and Greece approved the 12-month calendar of equal quarters. Both contained the perpetual feature.

The conference considered the time "not ripe" and, religious opposition having been expressed by Orthodox Jewry and the Seventh-Day Adventists, the League resubmitted calendar reform to its member governments . . . . with the request that it be given further study and stressing the need for obtaining greater enlightenment of public opinion on the advantages and disadvantages of the reform.

In summarizing the result, the president of the conference, Mr. Vasconcellos of Portugal, reported that as far as reform was desired the *preference* was for a *perpetual calendar* rather than for a mere regularization of the quarters (the Phillips plan).

Great interest was aroused in South America, where Dr. Ismael Gajardo Reyes of Chile organized, in 1934, the Latin-American Committee for The World Calendar. Through this committee, which represented the majority of the South American countries, he directed the activities of the national calendar reform organizations, and succeeded in winning the interest of a number of highly influential people—statesmen, priests and scholars. No bloc of national committees has been more powerful in the development of an international consciousness of the practical possibilities of calendar reform. It was as a result of this group's educational campaign that Señor Don Agustín Edwards, representative of Chile on the League Council and his country's Ambassador to Great Britain, in January 1937 submitted a Draft Convention to the League "requesting the adoption of the perpetual calendar of twelve months and equal quarters, known as The World Calendar," and declaring that this proposal "would be extremely convenient for commercial and business life and would enhance the welfare of the working classes, and would be very advantageous for all nations." The document further stated "the present Convention shall be ratified and the ratifications thereof shall be deposited with the Secretariat of the League of Nations not later than December 1, 1938." Here was a notable step raising calendar reform to a higher level. The calendar was marching on.

The League submitted the Chilean proposal to its member and non-member nations and 45 replies were received. Of these 14 (later increased to 17) approved the Convention; 6 rejected; 8 made no observations, including the United States; 10 were unprepared, with Soviet Russia one of them; and 7 considered the time premature, among them being France and the United Kingdom. The League did not consider the result satisfactory and the threat of war caused it to postpone the matter. World War II prevented further action. Thus ended all League participation.

The World Calendar Association, a non-political educational organization, free and independent in its activities, forged steadily ahead. Many committees were formed throughout the world—South America, Europe and Asia—which laid the background that broadened it to an international association in 1947. The World Calendar Association, International, was thus prepared to work on a world basis with the newly established United Nations organization.

Peru, following the example of Chile, in 1947 submitted a resolution to the Fourth Session of the Economic and Social Council of the United Nations stating: "Whereas it is widely recognized that the present calendar is unsatisfactory for the economic, social, educational, scientific and other activities of man; that there exists a general desire to bring about its revision, and that the new calendar should have twelve months and equal quarters, be perpetually the same with a stable pattern of quarter-years, months,

weeks, days and fixed holidays. . . . That the Economic and Social Council appoint an ad-hoc Committee to study and pass judgment on the adoption of a new calendar on January 1, 1950."

Upon the recommendation of the president of the Council a *Note* was prepared by the Secretary-General of the United Nations and distributed to the member governments. This *Note* is an important memorandum—a basic document for the approach of international action in the matter of calendar reform. It contains a most significant statement: "of all the drafts studied on the international plane, the draft [The World Calendar] submitted by Peru is the one which has received most favourable comments."

Hopes were high that at the Fifth Session of ECOSOC affirmative action would be taken on this much-needed reform. However, this did not happen. The proposal was dropped at the eleventh hour from the agenda. Other items appeared more important to the United Nations and were given priority. Postponement resulted.

Another opportunity was presented to The World Calendar Association two years later, in 1949. Undaunted and convinced of the rightness of the cause, Panama, the little strategic country through which the Panama Canal links North and Central America with South America, proposed the subject to the Fourth Regular Session of the United Nations General Assembly. Its representative, Dr. Ricardo J. Alfaro, presented a letter to the Secretary-General requesting that the subject be placed on the agenda of the Fourth Session. In the accompanying memorandum it was not only stated that "this perpetual calendar offers harmony and order to all strata of society" and that "millions of dollars annually would be saved," but that "the 365th day of the year in 'The World Calendar' is an international holiday, dedicated simultaneously in every country of the world to the universal harmony and unity of mankind, thus knitting all races, creeds, peoples and nations into a closer bond of fellowship, creating world-wide citizenship in the 'One World.' The potentialities of 'Worldsday' for strengthening and promoting international peace among all nations are of great value."

It is regrettable to record that the high plane on which calendar reform had now been placed was not recognized by the United Nations delegations in charge of the program committee. Again there was put forward the weak argument—"overcrowded agenda." (But when is an agenda not overcrowded?) The vote taken on the matter was 4 in behalf of the resolution, 4 against, 4 abstentions, with 2 absent. The vote lacked a majority, and the subject was automatically dropped from the agenda.

Meanwhile the Newspaper Advertising Executives Association had become interested and was instrumental in having The World Calendar introduced in joint bills in both houses of the United States 79th Congress, second session, 1946.

United Nations' failure to act in the matter, however, and the Orthodox Jewry and Seventh-Day Adventists injecting once again their own particular sectarian views in a civil calendar, clouded the issue. Subsequent bills in the 80th and 81st Congresses were permitted to "die in Committee"—they never reached the floor.

Another minor complication arose, in that a different 12-month revision had been introduced in Congress by the Hawaiian delegate, who presented the Edwards Perpetual Calendar. This plan differs from The World Calendar in that the extra day opens the year as "New Year's Day," presumably dated January 0, and Monday becomes January 1st, with all subsequent weeks beginning with a Monday. The familiar order of the weekdays is thus disarranged, Friday becomes the 5th, Saturday the 6th and Sunday the 7th day of the week. These wholly unnecessary changes, and beginning every week with a materialistic note, make the Edwards plan fall far short of the superior World Calendar. It also "died in Committee."

Because of the negative stand taken by the United Nations, Congress did not take action. In the words of Senator Estes Kefauver, who introduced the bill in the first session of the 81st Congress (1949): "Should the United Nations General Assembly take favorable action, I am confident that the United States Senate Foreign Relations Committee will report my bill out favorably, so that action can be taken on it in the Senate."

The World Calendar is invincible; another sponsor was forthcoming.

In 1953, India took the initiative by requesting the Secretary-General to place World Calendar Reform on the 18th Session of the Economic and Social Council of the United Nations at Geneva, July 1954. Here again is a clearcut proposal under the aegis of the United Nations for definite action to be taken toward finalizing the adoption of The World Calendar. It is imperative that this subject be given just and fair consideration at this important July conference. Hence it is reasonable to anticipate that the subject having been by-passed twice, this international body will wish to give it *this time* the earnest attention it so deservedly merits and, by so doing, the United Nations will advance its progress and calendar reform will be added to its other social and civil accomplishments.

India in its transmittal letter states: "The purpose of the plan is to adopt for the whole world . . . . a new, fixed, uniform and invariable calendar, regulated astronomically according to the movement of the Earth around the Sun, and more regular, scientific and advantageous than the Gregorian Calendar." It proposes The World Calendar as "of great importance to the nations of the world."

Definite action taken by ECOSOC in July will enable its findings to be presented to the General Assembly of the United Nations either in 1954 or 1955. The United Nations will then be in a position to submit The World

Calendar to the respective governments for legislative action. Thus the nations will know the recommendation reached by the United Nations Assembly on The World Calendar and preparations and plans can be made and legislative action taken among the various governments toward making the change effective. The new calendar can be put into operation on Sunday, January 1, 1956, or the next available date, January 1, 1961, when both the old and the new calendars agree, making the transition easy. The World Calendar belongs to a progressive civilization.

✧✧✧ *Chapter XI*

THIRTEEN'S RISE AND FALL

Thou art weighed in the balances, and art found wanting.
—Daniel 5:27

THE FIRST known proposal for a 13-month fixed calendar came from a colonial American in 1745 and was published in the *Gentleman's Magazine* of London under the guise of "Hirossa Ap-Iccum." Later in *Scott's Magazine* a "Mr. Urban" of Maryland also wrote an essay on a 13-month perpetual calendar.

Toward the middle of the nineteenth century, a French mathematician and philosopher, Auguste Comte, proposed another 13-month calendar that he belabored with innumerable names of great men in history. Such cumbersome naming of days, weeks, months, invited its failure from the outset.

It was not until many years later, in the early years of the twentieth century, that it was revived by Moses B. Cotsworth, who actively advocated and zealously worked for his proposal for the 13-month calendar.

Cotsworth, the modern "father of the 13-month calendar," was responsible for this type of calendar reform. Born in York, England, he was brought up by his grandparents who used the old shadow-pin, noon-mark and hour-glass methods, knowledge of which facilitated his later researches. His business training began with the North Eastern Railway Company, where he showed special aptitude for making calculations and investigations which brought him the commission to make extensive computations and adjustments in revising the British Railway rates, during 1891-1895. In recognition of his talents he was called upon to establish improved systems of railway statistics, which were adopted by the British Railway Companies and the Ministry of Transport.

This experience brought him into direct contact with the defects of the Gregorian calendar and the resultant difficulties with which every statistician must wrestle. He resented the many hours and the labor lost in adjusting

accounts on such a haphazard and wandering system of tabulation. Dealing strictly with figures, the 13-month calendar with its fixed months, each of 28 days and four weeks, appealed to him as the ideal solution. In his campaign for this plan he won the active support of the American business man and philanthropist, George Eastman, founder of the Eastman Kodak Company, who financed the campaign during his life.

Mr. Cotsworth's plan was simple. All the months of the calendar were given 28 days each, divided into four weeks, beginning with Sunday and ending with Saturday, with the 13th month inserted between June and July, called "Sol." With this established, the 364-day year was given an extra day with the suggested name "Year Day" in common years that would account for the 365th day, and "Leap Day" in leap years that was added in the midyear, which would be the 366th day. These days, besides having their own names, also had their special dates, December 29th in common years and June 29th in leap years. He proposed that these extra days be observed as holidays.

The advantages of the plan were as follows: Each month had the same number of working days and the same number of weeks; each month was comparable with all the other months; each week would be one-quarter of the month; dates for public meetings, law court sessions and other pending events would always be fixed; the end of each month would coincide with the end of the week. It was a plan especially designed for statisticians.

However, this plan had grievous drawbacks: The seasons were ignored; quarter-years could no longer approximate seasons by months, as each quarter would have 3 months plus one week or $3\frac{1}{4}$ months; as fractions are always complicated, the ultimate result would be the blotting out of months and the calendar be reduced to mathematical groupings of days and weeks by numbers; there would be thirteen monthly closings in the payment of bills, which would increase bookkeeping with attending expense; thirteen monthly rentals and thirteen monthly bills would add to the cost of living; the conversion of dates (as only the first 28 days would agree with 28 days of the Gregorian calendar) would bring innumerable difficulties; the remaining 337 days would all undergo change, nullifying past records and hampering research.

The 13-month plan would standardize the month to the point of rigid monotony and the calendar would lose its pleasing variety. Nature expresses infinite order with variety and does not conform to rigid patterns, as seen in her four different seasons, winds, and points of direction.

Mr. Cotsworth in his plan succeeded in bringing the calendar to the ultimate point of simplicity. However, the French astronomer Camille Flammarion had said, "such simplicity that falls into monotony is not adaptable to human life."

When the League of Nations submitted a plan in 1937 to its member

and non-member states, the selection was the Draft Convention of the Chilean government, which requested adoption of the perpetual 12-month year of equal quarters. The 13-month plan was thereby definitely eliminated.

Much credit, however, must be given the 13-month advocates who pioneered so valiantly to reform the calendar on a stable and fixed basis and to eliminate the annoying inconsistencies and inconveniences which beset the Gregorian calendar. They rendered the world a most valuable service *in preparing the way* for a better and more equalized system in which the changes are not so drastic, a variety with order is maintained, days and dates agree, all the different time units receive equal recognition, and balance and harmony in the calendar are obtained.

Thirteen-Month Calendar

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

Leap Day, June 29 Year Day, December 29

✧✧✧ *Chapter XII*

RUSSIA'S DIFFICULTIES

It is obvious that the eloquent demand of our century and of modern life will not stop before any difficulties, and therefore undoubtedly a practical solution of the calendar question is near.

—Leo Tolstoy

RUSSIAN calendar history is no exception to that of other calendars of the past; it has been a varied one with many trials and errors. Eventually the Gregorian calendar was adopted by the government to conform with the greater number of other nations.

Dr. Vera Rossovskaja, astronomer of the Research Institute at Leningrad, wrote a notable book, *The Remote Past of the Calendar*, published in 1936, in which she stated that up to the end of the fifteenth century the Russian year began on March 1st. Years were counted from the "creation of the world," an event that was placed in the year 5509 B.C. Then for a brief interval the Moscow government began the calendar year with September 1st, until about 1700 A.D., when Peter the Great introduced January 1st as the beginning of the year, adopting at the same time the reckoning of the Christian era. This aroused the opposition of the Eastern Church.

It was in 1709 that the calendar (the Julian calendar) was first printed in Russia, more than 127 years after the Gregorian calendar had been introduced in Europe.

In the nineteenth century, because of the almost world-wide acceptance of the Gregorian calendar, the Department of Foreign Affairs used the Gregorian style in its relations with foreign countries; the commercial and naval fleets too were obliged to reckon time according to the Western calendar; and finally sciences which had a world character, such as astronomy, meteorology, etc., were compelled to follow the new system. All this caused considerable complication.

In 1829 the Department of Public Instruction recommended a revision of the calendar to the Academy of Science. The Academy proceeded to petition the government to accept the Gregorian calendar. Prince Lieven, in submitting the plan to Tsar Nicholas I, denounced it as "premature, unnecessary, and likely to produce upheavals, and bewilderment of mind and conscience among the people." He further declared that "the advantage from a reform of this kind will be very small and immaterial, while the inconveniences and difficulties will be unavoidable and great." The Tsar, being apprehensive, wrote on the report: "The comments of Prince Lieven are accurate and just."

From thence onward frequent attempts were made to remove the ban, but to no avail. In 1918, after the Revolution, Lenin raised the question of calendar reform and, after an investigation of the subject, published a decree directing the adoption of the Gregorian style "for the purpose of being in harmony with all the civilized countries of the world."

The adoption of the Gregorian calendar necessitated a cancellation of 13 days, instead of ten days, because in the interval three centurial years had been counted as leap years. Although the government officially accepted the Gregorian calendar, the Russian Eastern Orthodox Church still clung to the earlier and more familiar Julian. This is the reason, for example, that the observance of Christmas, on December 25th in the Gregorian calendar, comes in the Julian calendar on January 7th.

In 1923, a radical change in the calendar took place. Soviet Russia abolished both the Julian calendar, used by the Russian Orthodox Church, and the official Gregorian calendar that had been installed by Lenin. A new calendar was introduced, in which the weeks were changed and all religious feasts and holy days were replaced by five national public holidays associated with the Revolution.

The "Eternal Calendar" went into effect on October 6th (Revolution Day), giving five days to the weeks and six weeks to the months, so that there were 12 months of 30 days, plus five holidays with national names instead of weekday names. The chief objective of the "Eternal Calendar" was to in-

crease production, and special color cards indicating the day of rest were distributed to the workers. Rest-days became staggered. It was not realized at the time that such an arrangement would cause real hardship to family life. After several years of trial, in 1931, the five-day week and staggered rest-days were replaced by another system.

This new plan provided for a 12-month year with the same holidays as before and the same extra day for leap years, but a new week of six days was introduced wherein the rest-day came regularly on the 6th, 12th, 18th, 24th and 30th of the month, in addition to the five national holidays.

Through all these changes decreed by the Russian government, the Church still clung to the Julian calendar, and farmers and peasants continued to work and plan according to the seasons, months and weeks, as had their forefathers.

To historians and statisticians these various calendar changes bring real difficulties. Reference to the Russian Julian calendar must be made previous to 1918, from 1918 to 1923 the Gregorian calendar was in use, from 1923 to 1931 the five-day Russian Revolutionary calendar must be consulted, and from 1931 until 1940 the Russian calendar with the six-day week was in effect. From 1940 onward, official Russia returned to the Gregorian calendar with its seven-day week, using Sunday as a rest-day. By this latest action the government returned to the idea of Lenin, and Russia is once more using the same calendar as "all the civilized countries of the world."

Leo Gruliow, editor of *The Current Digest of the Soviet Press*, recently wrote: "A combination of factors appears to have swung Russia into the growing list of supporters of calendar reform. Whether the Soviet will go beyond its present cautious endorsement of study of The World Calendar Association's proposal remains to be seen. That the development of the Russian studies will lead to beneficial results is definitely assured."

✧✧✧ *Chapter XIII*

INDIA'S CONFUSIONS

Men look to the East for the dawning things,
for the light of the rising sun,
—Douglas Mallock

CALENDAR reform took a real step forward when India declared itself in favor of it. Initiated in Europe, developed and advanced in the Americas, it has now through India's definite action expanded to include Asia. Thus three vast areas—Europe, the Americas and Asia—are all contributing to give the world a better idea of unity and cooperation by estab-

lishing a new world chronology—one and the same time-chart—The World Calendar.

Rudyard Kipling, born in India and familiar with her peoples and customs, wrote "East is East and West is West, and never the twain shall meet," *until* "there is neither East nor West, Border nor Breed nor Birth, when two strong men stand face to face, though they come from the ends of the earth!"

The imperative need for better understanding and fostering friendlier relationships between the East and West was thus greatly strengthened by India in recognizing two strong forces—Time and the Calendar—uniting the Eastern and Western Hemispheres. Time, we know, is the great healer; the Calendar can become the great uniter. Historians may well acclaim India's activity in calendar reform one of the most notable events of the twentieth century.

India's interest in this subject is easily understood, because her own calendar situation is "chaotic and intolerable." There are serious disadvantages under which India is laboring:

The government must print every year an official almanac containing four different calendars, including among these the Gregorian and Mohammedan; this enormous compilation consists of 3,273 pages: astrological practices and countless religious doctrines complicate recording of days, months and years; conflict exists between scientific astronomy and "fantastic astrology"; the calendar lacks a scientific basis on which to obtain accurate calculations and data; India has no national observatory: lunar calendars increase difficulties: the 1,400-year old rule relating to the seasons and the lengths of solar months causes wrong calculations and the lengths of solar months followed by the almanac makers violate the fundamental rules of scientific astronomy.

The following solutions have been suggested by Professor M. N. Saha, chairman of the Calendar Reform Committee of India:

Establish an Indian Greenwich, where annual compilations can be made; Ephemerides, Nautical and Air Almanacs can be printed: a national civil calendar can be instituted: the calendar should be based on the perpetual solar time-reckoning for the whole of India: lunar calendars should be avoided for all civil purposes: length of the year should be 365.2422 days: present irregular months should be replaced with the length of months as proposed in The World Calendar: and days should be calculated in the accepted astronomical manner, from midnight to midnight of Indian Greenwich.

The two "strong men," or powerful forces—Time and the Calendar —are fulfilling Kipling's prophecy. There will be no longer a cleavage between "border, breed nor birth," on the subject of Time when The World

Calendar has become the universal measure of Time on our Earth.

India's action before the United Nations and her official calendar committee, both undertaken with the sanction of Prime Minister Nehru, are lifting calendar reform to a high international position that deserves full recognition from the delegations of ECOSOC, particularly, as the subject is non-political, non-partisan, non-nationalistic and non-sectarian.

It has been said that the adoption of the solar calendar by the Egyptians marked a great cultural achievement. It can rightly be said that modern calendar reform—The World Calendar—sparked by India's active participation, will mark a significant step in establishing greater world unity and cooperation.

✧✧✧ *Chapter XIV*

WORLD CALENDAR REFORM

The times are big with tidings.
—Robert Southey

IT IS increasingly apparent when dealing with so universal a subject as the calendar that personal, political, national and religious bias have no part. Calendar revision affects all the peoples of the world, whether of the Far and Near East, West, North or South. Like the sun which shines upon the inhabitants of Earth, so the calendar influences all mankind. The point of view must be global and must consider the common good of all, not for the few or for any particular major or minor group. The revision must be approached with the perspective that the subject requires. By adhering to this simple principle, confusion and difficulties will be avoided.

My interest in calendar reform began in the summer of 1929 while staying at the Lake Placid Club, where I heard Dr. Melvil Dewey, founder and president, give a lecture "How To Simplify Life." He closed his talk with a strong plea to improve the calendar which, in its many irregularities, was far from satisfactory. He then advocated a 13-month calendar that disturbed me. How could a non-divisible number like 13 simplify?

A fortnight later, on Sunday September 8th, the *New York Times* published a letter by the engineer Lewis E. Ashbaugh of Denver, Colorado, in which he opposed the perpetual 13-month plan and advocated the more easily divisible perpetual 12-month calendar favored in Europe. He wrote: "While we are planning an improved calendar, let us also insist on the very best, with all conditions considered, and let us adopt the revised twelve

month year of equal quarters and equal working-day months, easily adapted from the calendar we now use." It instantly attracted my attention and as I was reading, I heard a clear voice saying: "*You must work for this plan.*" It was so real, I had to accede. I could not do otherwise for here was a call that had to be followed. It has ever been a shining light urging me on, convincing me that this plan comes from a higher power than that of man.

The proposed new plan—The World Calendar—is solar. It is based on a purely scientific and mathematical principle and its purpose is to meet the civil, social, economic, scientific, cultural and international requirements of the day. Religious feast days and national holidays have their regular places, but these are separate and distinct and do not affect its ordered arrangement.

The revised 12-month calendar accepts the perpetual feature of the Roman Catholic priest Marco Mastrofini who considered the year as of 364 days, wherein the 52 weeks (each of seven days) fit within the year.

The 365th day or the 1/7 of a week is placed at the end of December, an "extra" day between two weeks, that does not interfere with the week itself. This annual extra day has its name Worldsday and its specific date December W or December 31st. By this method every outgoing year is securely sealed with the new Worldsday, a new world holiday, and becomes a finished time period.

The annual "year-book," fully completed in its cycle and observed with proper celebration on the year-end Worldsday, is then placed on the archive shelves of Time, where it can be taken down for reference whenever desired. By this method every year is a complete unit of Time, no longer tied to a day of the first week of an incoming year. A new year-book is now ready to be opened on New Year's Day Sunday, January 1st.

The 366th day in leap years is likewise placed between two weeks in the mid-year after Saturday, June 30th, and before Sunday, July 1st. Its name is Leapyear Day and date June W or June 31st. In this manner the new Worldsday (365th day) every year and the new Leapyear Day (366th day) every four years keep the calendar equalized, balanced and perpetual. These new stabilizing days are unique in the calendar in being universally observed as *world holidays*.

The method of the extra day can be compared to an interesting Chinese fable.

A farmer, at his death, left 11 sheep to his three sons, with instructions that the eldest should have one-half the number of sheep, the second son one-quarter and the third son two-thirds of the remainder. This strange division greatly perplexed the family until a wise mathematician showed them a way of solving their problem. He told them to go to a neighbor and borrow a sheep. With this borrowed sheep, the sons now had 12 animals which they

could distribute in accordance with the wish of their venerable father. The eldest son received one-half the number, or six sheep; the second son received one-quarter, or three sheep; the youngest received two-thirds of the remainder, or two sheep. When the borrowed animal had thus served its purpose, the sons returned it to its owner.

In reverse, calendar reformers have solved their problem by *withholding* the 365th day, whereby the year has 364 days, a number easily divisible into equal quarter-years of 91 days each and equal half-years of 182 days each. With this satisfactory solution, the 365th day is returned to the calendar and placed at the end of the fourth or last quarter of the year as the new Worldsday.

The perpetual World Calendar retains the twelve months and divides these into equal quarter and half-years. Each quarter-year is given 3 months with the lengths more evenly apportioned. The first month has 31 days and begins with a Sunday, the following two months have 30 days each and begin respectively with a Wednesday and a Friday. Every month has 26 weekdays plus Sundays. Each quarter-year begins with Sunday and ends with Saturday, has 91 days, 13 weeks or 3 months approximating a season. Corresponding days and dates always agree and perfect co-ordination is had among the different time units, resulting in accurate comparability from year to year. Every year begins with Sunday, January 1st, and ends with the non-working new world holiday—Worldsday. Holidays can be stabilized according to the customs of the various nations. Likewise, religious feast and fast days are anchored to their regular days and dates and celebrated in keeping with the various religious faiths.

It is noteworthy that the *first* day of every year, every week and every quarter-year begins on a Sunday and that the *seventh* day of every year, every week and every quarter-year ends on a Saturday. For the first time in calendar history, the week will actually have its regular place in the calendar and will no longer impose the objectionable shifting of weekdays and dates as heretofore.

Only six months, between the 28th of February and the 1st of September, are changed by one or two days. From the 1st of September through the 28th of February, the calendar remains the same as the Gregorian.

The dates which call for change are three—March 31st, May 31st and August 31st—replaced by three new ones—February 29th and 30th and April 31st. This will call for a minor adjustment of days which were observed on the vanishing dates. Birthdays will now be observed on the day before, on the 30th of the month, the method used by leap-year children ever since 1236 A.D.—718 years ago when King Henry III of England decreed that the leap day should be "reckoned in the same month wherein it groweth and that day, and the day next going before, shall be accounted for

one day." For the first time in calendar history the *day* of birth will be honored with the *date*.

The World Calendar is a mathematical masterpiece. It deals as successfully with the arbitrary numbers 7 and 13 as with the easy numbers 2, 3, 4, 6 and 12. And with the aid of the one or two stabilizing days the calendar at long last has become a steady and reliable time-system.

This outstanding achievement cannot be credited to any one particular nation or person. It is the slow process of development in which many minds have contributed, many valuable historical facts have been explored, and increasing knowledge and understanding have been acquired. The calendar has at long last become a world measurement of Time—a universal world-chart for all humanity to use and enjoy.

What are some of the advantages?

In a large corporation, for instance, the tabulating and analyzing of the various statistical reports, essential in the evaluation of the business, are easily had because of the perfect co-ordination of the different time units. One department deals with the day, another with weekly or bi-monthly payments, then there are the monthly salaries and the seasonal and quarterly reports to be considered, all of which synchronize in every quarter, half-year and the year itself.

In every business and industry and in all the professions, a perpetual ordered calendar will facilitate methods of calculating Time as well as simplify bookkeeping.

It will do away with the guesswork of finding out on what date the first Tuesday after the first Monday in November will fall because it will always be November 7th.

Opening and closing schools and arranging vacation periods will be made easy because every year will have the same corresponding days and dates.

Holidays will be fixed in this new standardized calendar. This will benefit the employer in production and management since wandering holidays will no longer interfere with their activities; nor will the worker and employer lose out by closing plants and other places of business because of marooned working days.

A fixed Labor Day in America on its regular day and date, Monday, September 4th, is of great advantage to educational institutions and will eliminate costly expenses of preparing and printing new catalogues every year.

Interest payments, insurance premiums and rentals will be based on regular schedules, an advantage to both sides of the transaction. These and many other advantages, far too numerous to mention, will bring to the peoples many benefits with no favors given or discrimination shown against any one particular group.

Above all, the perpetual World Calendar is a true time-conserver and time-preserver. We are thus protecting our most valuable commodity—Time. It was Benjamin Franklin who admonished Americans "Do not squander time, for that's the stuff life is made of."

To achieve these desirable objectives certain outmoded customs and traditions should be abandoned. There must be a willingness to cease thinking of today in terms of yesterday and make the today stand for a better tomorrow. Sectarian, self-centered, narrow thinking must give way to wider universal fields of thinking. Horizons must expand beyond the confines of group interest, national bias, personal prejudice and religious bigotry.

In these days unity is particularly vital and it is incumbent upon nations to encourage systems wherein an interrelationship of greater understanding, harmony and good will is inculcated. The World Calendar is an outstanding example of this ideal. Certainly it bears tidings of great moment—One World Calendar for One World.

The World Calendar

January	31 days	July	31 days
February	30 days	August	30 days
March	30 days	September	30 days
April	31 days	October	31 days
May	30 days	November	30 days
June	30 days	December	30 days
Quadrennial Leapyear Day	June W or 31	Annual Worldsday	December W or 31

✧✧✧ *Chapter XV*

WORLD HOLIDAYS

. . . and the leaves of the tree
were for the healing of the nations.
—Revelation 22: 2

EVERY calendar change in the past carried a new and unusual feature that highlighted the reform. The Egyptians introduced the solar year of twelve months with 30 days to each month, closing it with five additional days so as to conform to the seasonal year. The Julian reform accepted the leap-year day. The Constantinian contribution was the week of seven days and the first day Sunday as the official day for Christian worship. The Gregorian harnessed the calendar to the seasons from which it had strayed, by cancelling ten days from the calendar and amending the leap-year rule.

The new feature of The World Calendar is the "Worldsday" that takes

the fractional 1/7 day of the week (none other than the 365th day of the year) and places it at the end of every year as an extra day. This new world holiday highlights the calendar by which method every year is stabilized, comparable to other years.

Similarly the necessary 366th day the "Leapyear Day," another world holiday, is placed between the last week of the second quarter and the first week of the third quarter in leap years and the calendar keeps its balance. They have each their respective dates, December W and June W or, if preferred, December 31st and June 31st.

It is of interest to note that this proposed new calendar follows a Biblical plan, the symbolic holy city of Jerusalem, that is based on a foursquare pattern. It has three months or "gates" to every quarter-year, twelve months to every year. The leaves of the tree of life within the city are for the "healing of the nations" which, in The World Calendar are the world holidays that in their international observance will foster greater unity among the nations.

It is lamentable to note that opposition has been expressed to these unique and beneficial world holidays on the ground that they will create two eight-day weeks—one at the end of every year and another in the middle of the calendar in leap years. These days, according to Orthodox Jewry and Seventh-Day Adventists, will cause wandering Sabbaths. They do not realize, however, that in the present Gregorian calendar the week constantly wanders throughout the year. Every new year is forced to begin on a different week-day so that the first date January 1st may fall on any one of the seven days. It is this grievous fault of wandering weeks which The World Calendar is correcting. With the new Worldsday in effect, every year will actually begin on the first day of the week, Sunday, and on the first day of the first month, January, and likewise the Sabbath will always be the seventh day of every new year. The calendar has become a stable instrument of Time for mankind's daily use, enhanced by the new world holidays—forming a rainbow bridge of varying colors whereon peoples of all climes, customs and faiths meet in a spirit of increasing understanding and fellowship.

In addition, travelers who cross the International Date Line unfailingly experience either an eight or a six-day week, depending on the direction taken. When Asia-bound the week is short and has but six days, when America-bound the week is extended to eight days. Here are instances when the "unbroken continuity" of the week is continuously being broken.

Worldsday and Leapyear Day in their international observance will bring peoples and nations closer together and awaken in them a keen awareness of man's interdependence and interrelationship.

In this all too brief history of the calendar and its effect on civilization, an outstanding lesson is clear. It must be freed from shackles of sectarian belief, superstition, tradition and narrow, restricting prejudice. Only as the

calendar is built on scientific astronomical and mathematical grounds can it freely serve humanity and the entire world.

On the matter of religious holidays and feast days, these indubitably rest with the religious leaders.

An outstanding calendar authority, Professor Martin P. Nilsson, in his scholarly book *Primitive Time-Reckoning*, writes in his concluding sentence that time-reckoning must be emancipated "from the fetters of religious cult."

In this belief *Calendar Marches On* closes its pages, convinced that as the calendar returns to its scientific basis—seasons and days and years—so will it keep true to the original concept of Time as designed by the Creator, Lord of the Universe.

WHEREAS after study and due deliberation on the merits of The World Calendar as against the calendar at present in use, this Congress should recognize that the calendar is the Nation's and indeed the world's standard of time, the measure of every act, and the timetable of our very lives. Being fixed, more orderly and better balanced and equalized than the present calendar, adoption of the revision offered by The World Calendar will not only adjust the calendar to the requirements of our modern world but may well be reflected in greater social and individual stability, better organization of life, and more harmonious relationships.

—The Honorable Elbert Duncan Thomas, United States Senate, from Senate Bill S. 1755, July 16, 1947.

MR. SPEAKER, many of the subjects which come before the Congress have immediate and long-range objectives of importance. None is concerned with a more enduring subject than time and the calendar.

It would be an impropriety and misfortune were anything so basic and universal to be permitted to acquire a partisan complexion. Time, and the calendar as a standard of time, are the property of all and belong to every person. No party, no race, no religion, and no organization can claim a vested right or ask preferential treatment at the expense of the majority. In our democratic nation the greater good for the greater number must prevail.

—The Honorable Karl E. Mundt, member of the Foreign Affairs Committee of the House of Representatives of the United States Congress, from the *Congressional Record*, July 15, 1946.

THE WORLD CALENDAR ASSOCIATION, INC.

ELISABETH ACHELIS, *President* CHARLES S. MCVEIGH, *Vice-President*
HARRIET A. LILLIE, *Secretary-Treasurer*

U. S. ADVISORY COMMITTEE

PAUL TALBOT BABSON
HENRY W. BEARCE
MRS. VERA W. BEGGS
EDWARD F. FLYNN
COMMODORE J. F. HELLWEG, U. S. N. (Ret.)
MRS. GUSTAV KETTERER
MRS. ROLAND H. LATHAM
REV. HENRY SMITH LEIPER, D.D.
DR. CLYDE R. MILLER
PROF. WM. STARR MYERS
CHARLES K. ROBINSON
DR. WAGNER SCHLESINGER
HOWARD C. SMITH
DR. HARLAN T. STETSON
Q. FORREST WALKER
RABBI MARTIN M. WEITZ

WORLD ADVISORY COMMITTEE

REV. JUAN V. MONTICELLI, S.S. (ARGENTINA)
H. J. M. ABRAHAM (AUSTRALIA)
JOHN K. LAVETT (AUSTRALIA)
PROF. A. D. ROSS (AUSTRALIA)
C. F. WALKER (AUSTRALIA)
DR. EUGENE DELPORTE (BELGIUM)
CORNEILLE MERTENS (BELGIUM)
DR. F. MOREAU (BELGIUM)
DR. GASTON BARRERA (BOLIVIA)
J. ROYDEN GILLEY (CANADA)
A. J. HILLS (CANADA)
PROF. ALBERTO CUMMING (CHILE)
R. P. EUGENIO V. ROSSO, S.S. (CHILE)
DR. CHU CHIA-HUA (CHINA)
DR. CH'ING-SUNG YÜ (CHINA)
JOSÉ BORRASE (COSTA RICA)
DR. ELIAS ENTRALGO (CUBA)
DR. SALVADOR MASSIP (CUBA)
BARNEY N. MORGAN (DOMINICAN REPUBLIC)
DR. JORGE G. EGRED (ECUADOR)
DR. RAFAEL H. ELIZALDE (ECUADOR)
SENATEUR JUSTIN GODART (FRANCE)
ABRAHAM FROWEIN (GERMANY)
A. RUTH FRY (GREAT BRITAIN)
JAMES AVERY JOYCE (GREAT BRITAIN)
LORD MERTHYR (GREAT BRITAIN)
SIR HAROLD SPENCER JONES (GREAT BRITAIN)
PROF. S. PLAKIDIS (GREECE)
ATHANASE POLITIS (GREECE)
MANUEL EDUARDO RODRIGUEZ (GUATEMALA)
DR. JULIO LOZANO (HONDURAS)
ING. MIGUEL ANGEL RAMOS (HONDURAS)
RAFAEL HELIODORO VALLE (HONDURAS)
DR. HASHIM AMIR ALI (INDIA)
PROF. M. N. SAHA (INDIA)
PROF. AMEDEO GIANNINI (ITALY)
DR. CARLO ROSSI (ITALY)
DR. S. IMOTO (JAPAN)
DR. JOE UETA (JAPAN)
DR. JOAQUIN GALLO (MEXICO)
DR. HORACIO HERRERA (MEXICO)
DR. I. L. THOMSEN (NEW ZEALAND)
DR. JOSÉ MONTALVAN (NICARAGUA)
MAJOR K. S. KLINGENBERG (NORWAY)
DR. JUAN RIVERA REYES (PANAMA)
LUIS MONTERO Y TIRADO (PERU)
RAMON CARO (PHILIPPINES)
NAPOLEON VIERA ALTAMIRANO (SALVADOR)
REV. ANTONIO ROMAÑÁ, S.J. (SPAIN)
RAMON XIMENEZ GIL DE AVALLE (SPAIN)
DR. EMILE MARCHAND (SWITZERLAND)
DR. I. A. DEREOGLU (TURKEY)
ELISABETH ACHELIS (U.S.A.)
PROF. ALBERTO REYES THÉVENET (URUGUAY)

THE WORLD CALENDAR ASSOCIATION INTERNATIONAL

AFFILIATES AND NATIONAL ORGANIZATIONS

ARGENTINA: The World Calendar Association, International, Affiliate, Rev. Fr. Juan V. Monticelli, S.S., Chairman, Calle Adolfo Berro 4050, Buenos Aires.

AUSTRALIA: The World Calendar Association, International, Affiliate, Prof. A. D. Ross, Chairman; John K. Lavett, Deputy Chairman, Box 4256, G.P.O., Sydney, N.S.W.

BELGIUM: The World Calendar Association, International, Affiliate, Dr. F. Moreau, Chairman, 115 av. George Bergmann, Brussels I.

BOLIVIA: Comité Boliviano del Calendario Mundial, Dr. Gaston Barrera, Chairman. La Paz University, La Paz.

BRAZIL: The World Calendar Association, International, Affiliate. (The Affiliate is at present without a Chairman due to death of Rear Admiral Radler de Aquino.)

CANADA: The World Calendar Association, International, Affiliate, A. J. Hills, Chairman, Room 31, 102 Bank St., Ottawa.

CHILE: Comité Chileno del Calendario Mundial, Prof. Alberto Cumming, Chairman, Calle Manuel Rodriguez, Santiago.

CHINA: The World Calendar Association, International, Affiliate, Dr. Ch'ing-Sung Yü, Honorary President; Dr. Chu Chia-hua, Chairman, 15 Chuan Chow St., Taipeh, Taiwan.

COLOMBIA: Comité Colombiano del Calendario Mundial, Dr. Belisario Ruiz Wilches, Chairman, Observatorio Astronomico Nacional, Apartado No. 2584, Bogotá.

COSTA RICA: The World Calendar Association, International, Affiliate, Don José Borrase, Chairman, "La Prensa Libre," Aptdo. Postal 1533, San José.

CUBA: The World Calendar Association, International, Affiliate, Dr. Elias Entralgo, Chairman, Havana University, Havana; Dr. Salvador Massip, Adviser.

DOMINICAN REPUBLIC: The World Calendar Association, International, Affiliate, Barney N. Morgan, Chairman, Box 727, Ciudad Trujillo.

ECUADOR: The World Calendar Association, International, Affiliate, Dr. Rafael H. Elizalde, Honorary President; Dr. Jorge Egred P., Chairman, Astronomical Observatory, Apartado 165, Quito.

FRANCE: The World Calendar Association, International, Affiliate, Senateur Justin Godart, President, Paris.

GREAT BRITAIN: The World Calendar Association, International, Affiliate, Lord Merthyr, Chairman, 20 Buckingham St., London W.C. 2.

GREECE: The World Calendar Association, International, Affiliate, Athanase Politis, Chairman; Prof. S. Plakidis, Secy., Observatory of University of Athens.

GUATEMALA: The World Calendar Association, International, Affiliate, Don Manuel Eduardo Rodriguez, Chairman, Diario "El Imparcial," Guatemala.

HONDURAS: The World Calendar Association, International, Affiliate, Don Julio Lozano, H. E. Don Rafael Heliodoro Valle, Honorary Presidents; Ingeniero Miguel Angel Ramos, Chairman, Biblioteca Nacional, Tegucigalpa.

INDIA: Committee on Calendar Reform, Prof. M. N. Saha, 92, Upper Circular Rd., Calcutta.

ITALY: Italian National Committee on Calendar Reform, Prof. Amedeo Giannini, Honorary Chairman; Dr. Carlo Rossi, Chairman, Piazza Armando Diaz 2, Milan.

JAPAN: The World Calendar Association, International, Affiliate, Dr. Joe Ueta, President; Dr. Susumu Imoto, Secretary, Osaka Municipal Planetarium, Yotsubashi, Nishiku, Osaka.

MEXICO: The World Calendar Association, International, Affiliate, Dr. Joaquín Gallo, Honorary President; Dr. Horacio Herrera, Chairman, Sociedad de Estudios Astronómicos y Geofísicos, Av. Observatorio No. 192, Tacubaya, D.F.

NEW ZEALAND: The World Calendar Association, International, Affiliate, Dr. I. L. Thomsen, Chairman, Carter Observatory, Wellington, W. 1.

NICARAGUA: The World Calendar Association, International, Affiliate, Don José H. Montalvan, Chairman, Palacio Nacional, Managua.

NORWAY: The World Calendar Association, International, Affiliate, Major K. S. Klingenberg, Chairman, Thomas Heftyes Gate 56B, Oslo.

PANAMA: The World Calendar Association, International, Affiliate, Dr. Juan Rivera Reyes, Chairman, Panama City.

PARAGUAY: Comité Paraguayano del Calendario Mundial, H. E. Señor Ministro Coronel Don Luis Irrazabal, Chairman, Paraguayan Embassy, Lima, Peru.

PERU: The World Calendar Association, International, Affiliate, Don Luis Montero y Tirado, Chairman, Av. Uruguay 305, Lima.

PHILIPPINES: The World Calendar Association, International, Affiliate, Ramon Caro, Chairman, 116 Padre Faura, Manila.

POLAND: Polish Committee for Calendar Reform. (The Committee is at present without a Chairman due to the death of Mr. Jakiel.)

SALVADOR: The World Calendar Association, International, Affiliate, Don Napoleon Viera Altamirano, Chairman, "El Diario de Hoy," San Salvador.

SPAIN: The World Calendar Association, International, Affiliate, Rev. Father Antonio Romañá, S.J., Honorary President; Ramon Ximenez Gil de Avalle, Chairman, Urgel, 44-1° 4ª, Barcelona.

SWITZERLAND: The World Calendar Association, International, Affiliate, Prof. Emile Marchand, Chmn., 2, Genferstrasse, Zurich.

TURKEY: The World Calendar Association, International, Affiliate, Dr. I. A. Dereoglu, Chairman, Beyoglu, Istiklal Caddesi 485, Istanbul.

UNITED STATES: The World Calendar Association, Inc., International, Affiliate, Elisabeth Achelis, President, 630 Fifth Avenue, New York 20.

URUGUAY: The World Calendar Association, International, Affiliate, Prof. Alberto Reyes Thévenet, Chairman, Liceo "Hector Miranda," Calle Sierra 2274, Montevideo.

YUGOSLAVIA: Yugoslavian Committee on Calendar Reform. (Without a Chairman due to the death of Mr. George Curcin.)